JULY • 1959

Supervisory Management

Should You Treat 'Em All Alike?

You can be flexible—
and still be fair.

WORK SIMPLIFICATION AT DU PONT

Here's how foremen at one company
learned to "work smarter—not harder."

WRITE LESS—SAY MORE

How to write job procedures
that will do their job.

GET RID OF THE SACRED COWS!

It's the practices nobody questions
that keep up the costs of paperwork.

AMERICAN MANAGEMENT ASSOCIATION

Words to Live By

The Test of Universality

YOU ARE FACING a dilemma; you are not quite sure which of two decisions to make. Apply the test of universality. Suppose your personal decision should become a universal custom: Would it bring the world happiness or unhappiness?

—ANONYMOUS

VOL. 4 NO. 7 • JULY 1959

Supervisory Management

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SUPERVISORY MANAGEMENT, July, 1959, Volume 4, Number 7. Published monthly by the American Management Association, Inc. Publication Offices, 10 Ferry Street, Concord, N. H. Editorial and Business Offices, 1515 Broadway, New York 36, N. Y.

Address all correspondence to SUPERVISORY MANAGEMENT, *American Management Association, Inc., 1515 Broadway, New York 36, N. Y.* Please notify us of change of address *six weeks in advance,* and include postal-zone numbers in all addresses.

Subscriptions: $7.50 per year (AMA members $6.50); bulk rates available. Single copies $1.00 (AMA members $.75). Second-class postage paid at Concord, N. H. The Association does not stand sponsor for views expressed by the authors in articles issued in or as its publications. Copyright © 1959 by American Management Association, Inc.

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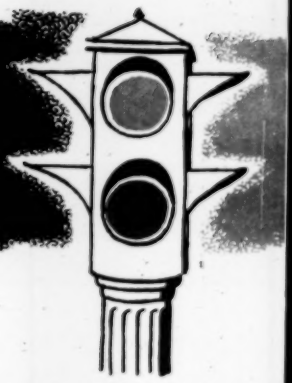
WORK SIMPLIFICATION at Du Pont



By L. L. Livengood

Control Assistant, Textile Fibers Department
E. I. du Pont de Nemours & Company, Inc.

Progress gets the green light as supervisors learn to "work smarter, not harder."

CAN YOU MAKE work simplification pay off?

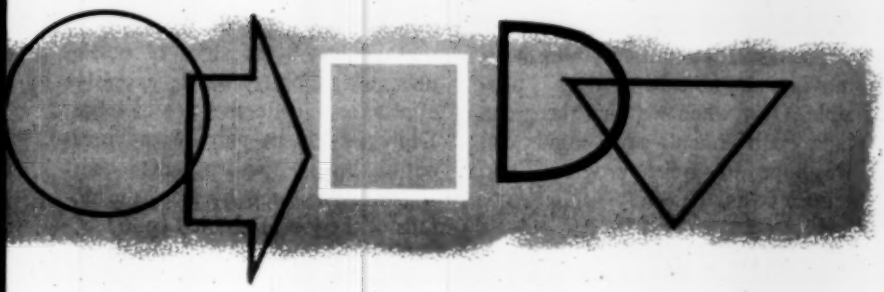
Du Pont's experience demonstrates that the rewards can be substantial. During the past several years, a number of its plants have conducted work-simplification programs for supervisory personnel—foremen, engineers, chemists, and plant managers. As a result, these people have been able to reduce plant costs and increase company profits.

Work simplification itself is nothing new, of course: People have always sought an easier way of doing things. All of us try to simplify our work; but, because of the lack of a scientific approach and a good method of analysis, we seldom go all the way.

If this desire for an easier way of doing work is acted upon in an organized fashion, a work-simplification program exists. "Work simplification" can therefore be defined as *the organized application of common sense to find simpler and better ways of doing work.*

Everyone pitches in

A work-simplification program today enlists the cooperation of everyone in the organization. Each person is trained to think for himself in terms of time- and labor-saving methods. He is taught to ask "Why?" about everything he does and is encouraged to suggest ideas for improvement. Modern work simplification, therefore, is not the old-style "efficiency work" which failed to enlist the initiative and voluntary cooperation of operators and supervisors. Nor is it merely a speed-up program. It does not ask anyone to work harder or faster; rather, it tries to get people to "work



smarter"—which has far more appeal.

The formal idea of work simplification originated with Allan H. Mogensen in about 1930. Its further development and refinement have come about largely through the efforts of Mogensen and his associates.

Here is how work-simplification training is carried out at one Du Pont plant.

All supervisors, including engineers and chemists, and key nonsupervisory personnel are given training in work simplification. The course consists of seven two-hour sessions.

"Work smarter . . ."

The first session is opened with a ten-minute talk by a member of plant management. The subjects discussed in this session include the history, definition, objectives, and approach of work simplification, and some of the factors that affect costs. The theme of the program is "Work smarter, not harder."

The basic objective of work simplification is to reduce costs through more effective work. We discuss some of the factors that affect costs, such as resistance to change and resentment of criticism, both of which force costs up. People tend to resist new ideas. For example, consider an editorial that appeared in a big-city newspaper a little more than 80 years ago:

> A man about 46 years of age, giving the name of Joshua Coppersmith, has been arrested in New York for attempting to extort funds from ignorant and superstitious people by exhibiting a device which he says will convey the human voice any distance over metallic wires, so that it will be heard by the listener at the other end. He calls the instrument a "telephone," which is obviously intended to imitate the word "telegraph" and win the confidence of those who know of the success of the latter instrument without understanding the principles on which it is based. Well-informed people know that it is impossible to transmit the human voice over wires.

Then, too, people resent criticism. They don't like to be told that they are wrong. Unfortunately, a suggestion is often misconstrued as criticism. Mogensen has compared our minds to a traffic system: We turn

on the red light when we feel we are being criticized. Everything stops moving, and no flow of ideas is possible. Only when we turn the green light on by opening our minds can we hope to make progress—and reduce costs.

Getting down to specifics

In the second session, we talk about *waste*—waste of manpower, equipment, material, supplies, and other resources. Waste is what keeps product costs high. We have found that the greatest obstacle to simplifying work and eliminating waste is not technical difficulty, but resistance to improvement in the minds of the people doing the work. Work simplification helps to change this mental attitude, developing an open mind and stimulating cost-consciousness.

Also in this session, a problem is presented to see if the participants can find a better way of doing the job. This problem is used to introduce a discussion of what we call the "five-step work-simplification pattern," sometimes referred to as the "five D's"—*define, detail, dissect, develop,* and *do.* The flow process chart prepared as part of the discussion is the backbone of our work-simplification program.

The "present-method" flow chart

In the second session, the participant is also asked to search his area of responsibility for a job that needs improvement. It is suggested that he watch for signs of bottlenecks, high costs, waste, excessive efforts, and ineffective use of labor. Each participant prepares a "present-method" flow process chart which shows, step by step, the details of the job (Exhibit 1, p. 6).

The third session is devoted entirely to a discussion of the *flow process charts.* Each participant presents his chart to the group for constructive criticism.

In the fourth session, we discuss *the approach the participant should follow* in improving the job he has selected. This is an organized, common-sense approach, not limited to experts, but within the reach of everyone. It requires, first, the "simplicity to wonder"—a quality that most children have but most adults tend to lose. When a child asks, "Where does the light go when you turn it off?" he is showing the simplicity to wonder.

Questioning for improvement

Another necessary quality is the ability to question. In work simplification, we must first question the job as a whole, then each detail of the job, to see if we can arrive at a better method. The first question to ask is: Why is the job necessary? If the whole job can be eliminated, the need for further analysis is unnecessary; this is where the biggest savings can be achieved. If the job cannot be eliminated, five basic questions must be asked about each

detail of the job: *What? Where? When? Who?* and *How?* Each of these questions should be followed up by another question: *Why?*

The sequence of questions in a particular case might be something like this: What is done? Why is it necessary? Where is it done? Why is it done there? When is it done? Why is it done at that time or in that sequence? Who does it? Why does he or she do it? How is it done? Why is it done that way? If there is an unsatisfactory answer to one of these questions, a check mark is made in the "Analysis" column of the flow process chart to indicate the possibility of improvement.

The "proposed-method" chart

These questions lead directly to actions that can be taken. Is it possible to eliminate, combine; change the place, sequence, or person; or refine or improve the method? The "Action" column of the chart is checked to indicate the action to be taken. At this point the participants are ready to make up "proposed-method" flow process charts (Exhibit 2, p. 7) showing how the job will be done if all suggested changes are approved. (These charts are discussed in the sixth session.)

Motion economy

The fifth session is devoted to motion economy, which ties in with the "How?" question in the questioning technique. Four principles of motion economy are discussed. First, motions should be productive. Nonproductive motions should be eliminated, and everything should have a place and be kept in it.

The Five D's of Work Simplification

Define
Detail
Dissect
Develop
Do

The second principle is that motions should be rhythmic and should flow smoothly. Symmetrical movements in arcs and opposing directions are natural and contribute to smooth flow and rhythm. Compare, for example, waltzing and jitterbugging: Waltzing is smoother—and easier.

The third principle is that motions should be as simple as possible. They should involve as few parts of the body as possible, and should require the least possible time and effort.

The fourth principle is that the worker should be at ease, physically and mentally. Good supervision can help to provide mental ease. Factors like correct workplace height, proper lighting, good ventilation, and adequate provision for sitting or standing all contribute to the worker's physical comfort.

Our objective in discussing motion economy is to make the participants motion-minded. We hope

EN-3313 REV. 7-56

WORK SIMPLIFICATION

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

FLOW PROCESS CHART

Is It Necessary?

NO. 1

PAGE 1 OF 1

SUMMARY

	PRESENT		PROPOSED		DIFFERENCE	
	No.	TIME	No.	TIME	No.	TIME
○ OPERATIONS	15					
⇨ TRANSPORTATIONS	3					
□ INSPECTIONS	1					
D DELAYS	5					
▽ STORAGES	1					
DISTANCE TRAVELLED	130 FT.		FT.		FT.	

JOB Handling Finished Product

☐ MAN OR ☑ MATERIAL Drum

CHART BEGINS On Scale at Burner

CHART ENDS Dumped in Boxcar

CHARTED BY H. E. Brown DATE 1-19-59

	DETAILS OF (PRESENT / PROPOSED) METHOD	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS: WHY?	NOTES	ACTION: ELIMINATE	COMBINE	CHANGE SEQUENCE	CHANGE PERSON	CHANGE PLACE
1	Placed on scale at burner	○								✓						
2	Waits				●						For filling					
3	Filled	○														
4	Weighed			□				450#		✓		✓				
5	Waits				●					✓	weight recorded	✓				
6	Picked up		⇨								On handtruck					
7	Moved to storage		⇨				20	1								
8	Waits					▽				✓		✓				
9	Covered	○								✓	Krough cover		✓			
10	Stored					▽					Temporary					
11	Uncovered	○														
12	"Broken"									✓	Dead weight raised on drum edge	✓				
13	Wheeled into position		⇨							✓		✓				
14	Waits				●						For pickup					
15	"Bulled" into payloader		⇨							✓✓			✓✓			
16	Moved to boxcar		⇨				100	1			Across road					
17	Raised in transit		⇨								5' to car floor level					
18	Set down on floor		⇨													
19	Waits				●						For pickup					
20	Removed from scoop		⇨							✓✓	2 men		✓✓			
21	Moved to position		⇨				10									
22	Positioned		⇨								In front of block					
23	Pushed over block		⇨								As fulcrum					
24	Lifted up		⇨								450# upended					
25	Dumped	●														

EXHIBIT 1

EH-3313 REV. 7-52

WORK SIMPLIFICATION

E. I. DU PONT DE NEMOURS & COMPANY INCORPORATED

FLOW PROCESS CHART

Is It Necessary?

NO. 2

PAGE 1 OF 1

SUMMARY

	PRESENT		PROPOSED		DIFFERENCE	
	No.	TIME	No.	TIME	No.	TIME
○ OPERATIONS	15		11		4	
⇨ TRANSPORTATIONS	3		3		-	
□ INSPECTIONS	1		-		1	
D DELAYS	5		3		2	
▽ STORAGES	1		1		-	
DISTANCE TRAVELLED	130 FT.		130 FT.		— FT.	

JOB Handling Finished Product

☐ MAN OR ☑ MATERIAL Drum

CHART BEGINS At Burner

CHART ENDS Dumped in Boxcar

CHARTED BY H. E. Brown DATE 2-3-59

	DETAILS OF (PRESENT) (PROPOSED) METHOD	OPERATION / TRANSPORT / INSPECTION / DELAY / STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS: WHAT / WHY / WHERE / WHEN / WHO / HOW	NOTES	ACTION: ELIMINATE / COMBINE / REARRANGE / SIMPLIFY
1	Waits	○◇□D▽						
2	Filled	●◇□D▽						
3	Covered	○◇□D▽						
4	Picked up	○◇□D▽						
5	Moved to storage	○◇□D▽						
6	Storage	○◇□D▽	20					
7	Uncovered	○◇□D▽						
8	Waits	○◇□D▽						
9	Grabbed	○◇□D▽					By horizontal attachment on lift truck	
10	Moved to boxcar	○◇□D▽	100					
11	Raised in transit	○◇□D▽						
12	Placed on floor	○◇□D▽						
13	Waits	○◇□D▽						
14	Moved to position	○◇□D▽	10					
15	Positioned	○◇□D▽						
16	Pushed over block	○◇□D▽						
17	Lifted	○◇□D▽						
18	Dumped	●◇□D▽						
19		○◇□D▽						
20		○◇□D▽						
21		○◇□D▽						
22		○◇□D▽						
23		○◇□D▽						
24		○◇□D▽						
25		○◇□D▽						

EXHIBIT 2

that they will acquire the ability to visualize their jobs in terms of the motions involved. In order to acquire motion-mindedness, one must picture mentally the motions necessary to perform an operation and separate them from motions that are not needed.

Selling ideas

In the sixth session, participants discuss their "proposed-method" charts. The seventh session is concerned with selling ideas. Selling the idea is, after all, the payoff. No matter how much time has been spent on simplifying the job and preparing charts, it has all been wasted unless the improvement can be put into effect. In this session we discuss a few basic principles for getting ideas accepted by others; for example:

1. Consider the personality of the "buyer" in determining the proper approach to use.

2. Point out the disadvantages as well as the advantages—that is, be honest.

3. Make contrasts where possible, to show the differences between the present and proposed methods.

4. Leave room for improvement. Any contribution the buyer makes to a plan makes him also the seller.

5. Select a time for the "sale" when the buyer will be receptive.

6. Appeal to the buyer's self-interest by putting yourself in his shoes: Show him how the idea helps *his* costs, quality, and safety.

The Four Principles of Motion Economy

1. Motions should be productive.
2. Motions should be rhythmic.
3. Motions should be as simple as possible.
4. The worker should be at ease, physically and mentally.

Cutting paperwork

The session on selling ideas completes the training phase of work simplification for our manufacturing and technical personnel. To supplement the regular work-simplification program for these people, we conduct a paperwork-simplification program designed specifically to reduce costs in the plant's clerical operations. Key nonsupervisory personnel from accounting and related areas are given a course that is basically the same as the work-simplification course for supervisors, but with emphasis on paperwork.

The open mind

Our purpose throughout both simplification programs is to change the mental traffic light from red to green—that is, to develop open minds.

Each participant selects a job for improvement. He is encouraged to follow through on his idea and put it into effect. Actual follow-up of

these projects, however, is the responsibility of the line organization.

This work-simplification program described above was carried out at one Du Pont plant. The program will be kept alive by means of refresher courses. It is hoped that the people there will continue to prepare flow process charts on jobs they study. More important, however, is the state of mind produced by work-simplification training: alertness, open-mindedness, and a questioning attitude. ♦

Pass the Aspirin

MEN STATIONED in Antarctica during the recent International Geophysical Year frequently suffered from headaches—but not because of the cold.

Station medical officers felt that few of the headaches could be attributed to eye strain, poor ventilation, fatigue, cold, hunger, or sinus trouble. Most of the headaches occurred during the winter months when there was little outside activity.

The headaches apparently were of emotional origin, Captain Charles S. Mullin, Jr., a Navy psychiatrist, said in the May 9 *Journal of the American Medical Association*.

He explained that the men, living in very close quarters for a year, realized that they must control their aggression and hostility. The resulting tension caused the headaches.

At small stations there was a "remarkable absence of either physical fights or hostile-angry arguments." The men recognized the need for control and for avoiding open breaks. This abnormal control could not be achieved without some cost in terms of accumulated tension.

Studies showed that the civilian-officer group suffered more headaches than the enlisted group.

The enlisted men were perhaps more fortunate in having more varied methods of handling the problem, Captain Mullin said. For example, there were violent swearing, vigorous horseplay, and "an interesting technique of exchanging frank and fearful insults, often quite personal and to the point, but apparently rarely reacted to with much, if any, anger."

ALL MANKIND is divided into three classes: those that are immovable, those that are movable, and those that move.

—BENJAMIN FRANKLIN

Should You Treat 'em All Alike?

By John Perian

Chief, Personnel Division, Veterans Administration Hospital
Durham, North Carolina

There is very little difference between one man and another, but that little difference is very important.

—WILLIAM JAMES

THERE'S AN OLD TALE about a king who lined up his subjects to cut off the heads of the tall ones. "This way," he announced, "no one will be bigger than anyone else."

His subjects didn't care for the idea; they felt it would be less trouble to cut off just one head—the king's.

And that, roughly stated, is the reaction of most people everywhere.

Yet one of the most persistent and popular fallacies in supervision is that all employees want to have the same status and to be treated alike. If there's one thing that employees do *not* want, it is to be treated the same way, like units on a production line.

Instead, they want to be treated *like others of the same status.* There is a decided difference between this and being treated alike. The very fact that employees are vitally conscious of status indicates that they do not enjoy being treated alike.

Fair and democratic?

Conceivably, treating everyone the same is easier and, perhaps,

more convenient for the supervisor than treating each worker as an individual. Quite often, managers rationalize equal treatment by saying, "We want to be fair and democratic." To be that way is, of course, a commendable goal.

But the treat-'em-alike approach is *not* fair and democratic. Nor is it realistic. In fact, such unimaginative administration can actually cause dissatisfaction among employees.

Take the case of Charlie Farrell, a superconscientious bookkeeper who made it a practice to get in early every morning to "get set" for the day.

One Monday morning he arrived at 8:30 to find this mimeographed notice on his desk:

> We hate to bring up the subject of punctuality again, but everyone in this department has been getting extremely slack. It's not enough to get out the work—we also have to start on time!
>
> So far we have not required office employees to punch a time clock. But unless punctuality improves, we're going to have to install a clock at the office entrance.
>
> We know we can count on you to cooperate from now on.
>
> —Earl G. Borden
> Office Manager

Charlie wouldn't have objected to the note in principle. He agreed that people should get in on time. But the "everyone" burned him—for it meant that his unfailing, conscientious punctuality had gone unnoticed.

Yet it would have been very simple for the office manager to have worded the memo differently or to have told Charlie that the reprimand was not meant for him.

It takes flexibility

Supervision that is truly fair and democratic must have some flexibility. The supervisor must recognize and provide for the *differences* among people—their capacities, their responsibilities, and the rights that they earn. Blindly treating every employee in exactly the same manner doesn't allow for such distinctions.

The importance, the desirability, and the necessity of administering benefits and privileges fairly are obvious. But within the area of fair treatment for all, there is wide leeway in the way each employee may best be supervised.

People are different

The reason that employees don't want to be treated the same is, simply, that they are *not* the same.

Psychologists tell us that people are born with innate differences. Some are quick tempered while others never seem to get angry. Some have great manual dexterity, while others just can't work with their hands. Some have driving ambition—others have driving energy—still others just want to be comfortable. Some have an unusual ability to get along with people. Some have unusual memories. Each has his own qualities.

And, psychologists continue, peo-

ple are the sum total of their experience. Whatever they encounter in life (and work, of course, is part of it) can improve—or corrupt—their inborn capacities.

On the job, employees come together and bring with them their varying mental capacities, inherent abilities, and backlogs of experience—factors that determine each person's emotional needs. And what a man needs largely determines the goals he seeks.

Thus, every workforce will include people with a variety of different needs and, as a result, different goals.

Consider the differences

The smart supervisor takes these differences into consideration. He won't, for example, treat a joke-swapping, middle-aged sales veteran in the same way that he'd treat a shy high-school boy who works part time. The highly logical approach that might be right for an industrial engineer or someone in R&D might not work at all with a storekeeper or someone on the loading platform out back. And it would be smart to recognize substantial differences between the boss's unmarried secretary, who has been with the company 35 years, and the teen-age girl recently hired for the steno pool.

Consider that girl, for example. She's working as a stenographer, but what she really wants is to marry and raise a family. That's her goal and, although it's personal, it affects her while she's on the job. Considering employment only temporary, she may not be concerned about—or impressed by—offers of career advancement or a retirement pension. Instead, she is interested in day-to-day needs——desk space, office conditions, personal facilities, the friendliness of her associates—whatever makes her job agreeable *now*.

The need for status

Practically all workers also give close attention to the way they are treated *in relation to other employees*. Whenever he compares himself with others, each employee is automatically considering his own status. This awareness of status—and the usual desire to improve it—makes most employees conscious of special authority or privileges.

A veteran employee, for example, is distinguished by at least one obvious factor—his long service. This gives him, he feels, a special status that he has earned—and deserved—through many years of continuous loyalty and effort. He wants this status respected, especially in such matters as layoff and recall, vacations, leave accrual, and promotions.

A curious twist

This leads to what seems like a curious twist: Although the employee doesn't want to be treated just like everybody else, he wants to be

"Getting to Know You"

YOU CAN'T TREAT PEOPLE as individuals unless you know them as individuals. Here are some ways to learn your subordinates' interests, abilities, experience, and needs.

1. Observe them; watch how they react to different situations.
2. Review their personnel records.
3. Listen to what they say, and how they say it.
4. Listen to what they *don't* say.
5. Encourage a little healthful griping.

treated *at least as well as others of the same status*. Therefore, a special privilege granted to an employee because of seniority must be granted to all who have worked the same length of time.

Actually, this isn't the contradiction it may seem. The worker has good reasons for not wanting to be treated like everyone else. Only if he's treated as an individual, he feels, will his strong points be given the special consideration that they deserve (and his weaknesses be evaluated as tolerantly as possible).

When, on the other hand, he insists upon *equality* within the status group, he is also logical. To accept less, he feels, risks loss of status. But to receive the same—or better—treatment as others in the same group indicates that he's still in the running.

Take the example of parking space: One newly hired supervisor had been parking his car in a lot that was generally used only by nonsupervisory personnel. It happened to be convenient for him.

But when he learned that supervisors had a special lot of their own, he immediately applied for space there—even though he had to walk farther to get to his office.

And that wasn't the end of it. Shortly afterward, the same supervisor was campaigning for another change. The specific space he had been assigned in the supervisors' lot, he said, didn't compare with that assigned to others. He wanted to be up front, nearer the entrance gate.

For this man, there was a clear connection between where he parked his car and where he stood with the company.

From individual to group

Because they tend to affect production, such personal preferences and differences have increasingly come to be recognized as vital in industry. An employee will strive and work hard to achieve self-imposed goals. If these goals coincide with (or run parallel to) company goals, he increases his productive effort accordingly.

And, it's apparent, the productivity of the individual affects that of

the group. Only through each man's performing to the best of his ability can the group, as a whole, perform to the best of *its* ability.

Discovering subordinates' needs

There are several initial steps for getting to know the personal needs of subordinates:

1) Observe people at work and watch how they react to different situations. If you don't already have it, you'll soon acquire the knack for picking out their reactions. Another big help is the study and review of each man's personnel records. It will provide many facts about individual interests and abilities, attitudes, previous experience, and past performance.

2) Talk to subordinates—even if it seems like only small talk at first. It shouldn't take long to know—without prying—something about each person's background, concerns, and interests.

3) Listen to employees. Since conversation is a two-way street, your talking to subordinates will result in their talking to you. Be sure to listen to what they say, and also to how they say it.

4) Take heed, also, of what employees do *not* say. A worker may hesitate, for example, because he's getting ready to say something that is *really* important. If you suspect this, encourage him tactfully. Or, if your subordinates are altogether silent, they may be seething with negative comments. Encouraging a little healthful griping might provide a safety valve.

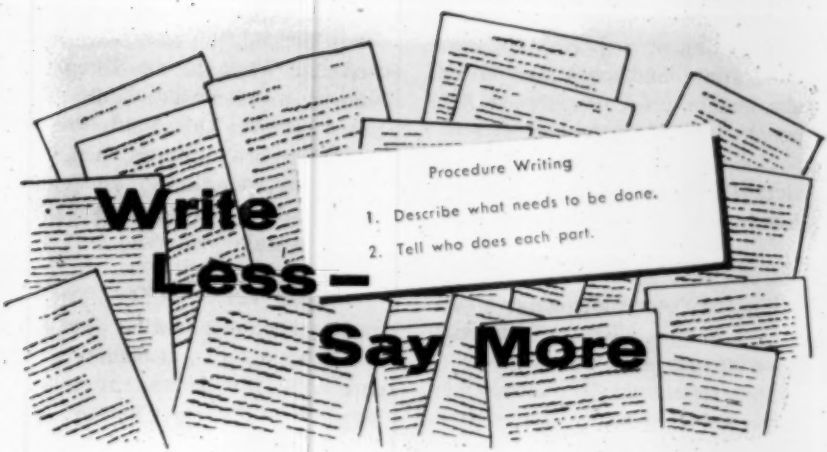
The supervisor's status

The best way for a supervisor to win mutual interest and cooperation from his subordinates is to show genuine interest in them. Whether the supervisor knows it or not, this battle is already half won, for the subordinate is definitely interested in him! Employees want a friendly relationship and often respond quickly as soon as the supervisor shows friendliness toward them, for they look up to—and like to look up to —their leaders.

In short, then, each employee wants to be treated equally within the limits of fair play. But no one objects to being treated better than that—to being recognized as a distinct personality, to receiving consideration for his special characteristics, and to having his position respected. To observe this is to acknowledge the worker's individuality—and to encourage his full productivity.♦

SOMETIMES WHEN WE THINK we're thinking, we are really not thinking at all—we are only rearranging our prejudices.

—ANONYMOUS



Write Less— Say More

By Clifford I. Haga
University of Minnesota
Institute of Technology

Who does what? That's the key to writing effective job procedures.

THE TROUBLE with a good deal of business communication is that it *overcommunicates*. It says too much and in too many words.

This is especially true of written procedures. They are intended as clear, easy statements, but they are usually hard to read—and even harder to understand. The employees who must use them are often able to do so only through sheer determination and hard work.

One problem, of course, is that the procedure writer simply may not know how to tackle the job.

Another problem is that the author may get carried away by his own composition. With delight in his handiwork, he puts himself and his "style" between his reader and the subject matter. (It couldn't be more obvious if he shouted, "Look, Ma—I'm *writing!*") He forgets that writing is intended to convey meaning.

For instance, try to make sense of the material in Figure 1 (page 16). It is from a manual entitled "Format for Procedures," and it attempts to describe how material that is supplementary to a procedure should be labeled and titled.

Actually, how much does it say?

A friend who looked at this commented: "That bird may think he's writing a procedure. But heck, he's

only writing *writing*. He's not communicating. Somebody should tell him that a procedure should *help* people."

Good advice. But like much advice, it's not always easy to follow. Just how do you write a procedure?

What and who?

First, let's consider what a procedure is. It is a written instruction covering the steps that a group of people should take to complete a job—perhaps buying, selling, shipping, designing, or manufacturing. A good procedure tells two facts: First, it describes *what* needs to be done. Second, it tells *who* does each part. When these two steps are brought together successfully, the group achieves the desired result.

A procedure's purpose, then, is to delegate responsibility. It depicts how people are to work together—how they are to *proceed*.

Simplicity and brevity

A procedure should be simple. It should also start at a definite place and stop at a definite place. Between the start and the stop, only the necessary processing steps should be given. But they must be given clearly and understandably.

TABULATIONS—ATTACHMENTS—EXHIBITS. Frequently, tabulations or other material which would interrupt the smooth flow or continuity of the procedure can conveniently be provided in the form of an attachment or exhibit. When attachments or exhibits are used, the following rules should be observed—

a. Provisions must be made in the body of the procedure for such attachments or exhibits. In other words, extra pages in the form of attachments or exhibits should not be appended to a procedure without some reference or explanation in the procedure as to the nature and purpose of such attachments or exhibits.
b. All attachments or exhibits should be lettered (A, B, C, etc.) or numbered (1, 2, 3, etc.) and usually should be given an explanatory title.
c. The attachment or exhibit, in addition to bearing the identifying letter or number and title, should contain at the bottom of each page a reference, by date and subject, to the procedure to which it is an attachment.
d. If an attachment or exhibit exceeds one page in length, the second and succeeding pages must be numbered and in addition must indicate that such pages are a continuation of an attachment A or exhibit #1, as the case may be, e.g.,—"page 2 of attachment A continued."

Figure 1. (from a procedure entitled "Format for Procedures.")

Written procedures should also be brief—the shorter the better. Actually, most industrial and business processes are short enough so that the procedure can be described in one page. A medium-cycle process may require two pages; few processes take more than three.

If we take this approach to the "Format of Procedures" (Figure 1), we come up with something remarkably different (Figure 2). This shows the same material cut down to size and put into language that communicates. It has been shortened by two thirds, yet gives the reader more information than the wordier version.

Cut to communicate

Let's compare Figure 1 with Figure 2, step by step:

The first paragraph: The starting paragraph in the original version must be read several times to get the point. After such rereading, we can see that it contributes no meaning beyond what could be conveyed by a one-word title: "Supplements." Thus, in Figure 2, we have only that one word—"Supplements"—where there had been 43.

Paragraph a: The original says only that any supplementary material should not be attached without some reference or explanation. That's simple enough. Why not state it simply?

The second version does just that, with a saving in space and reading time.

Paragraph b: The original takes risks because its instructions are indefinite; the worker is left to choose one of two identification systems—numbers or letters. Isn't it wiser to specify which is preferred?

The worker is also left to decide whether or not to use a title. His instructions say only that it's "usual." If a title is needed, say so. If not, why mention it at all?

Figure 2 corrects these faults by requesting identification by both number and title. To answer possible questions, two examples are given.

Paragraphs c and *d* in the original tell how to number the first and succeeding pages of supplementary materials. These instructions are un-

SUPPLEMENTS

a. Supplements—such as codes, schedules, forms, or flow charts—may be attached, provided they are referred to or explained in the text.

b. Number and title each supplement.
Example: Exhibit 1. "EP"—Entry points of the order
Exhibit 2. Distribution of Form 00-0000

Figure 2. "Format for Procedures," cut to size

necessary if the supplement is part of the procedure—and it is. As such, it should be paged in the same manner as any other part, and instructions for this appear elsewhere in the document.

Thus, paragraphs *c* and *d* are omitted.

Untangling the snarls

Rewriting has cut the original by about 80 per cent—from some 202 words to only 43. Instead of a word-heavy snarl, we now have simple, clear-cut instructions. We did this job, not by following rigid rules, but by using common sense.

So far, we have been talking about narrative procedures—words strung together into sentences and paragraphs. This is a method commonly employed in cookbooks—which, incidentally, are excellent examples of narrative procedure. The narrative method has disadvantages and advantages: It tends to be long, but it preserves continuity.

Narrative is not the only method for writing procedures, however. Three other methods are even more terse and, under certain conditions, easier to follow: the *playscript,* the *live specimen,* and the *matrix.*

The playscript

Actors in the theatre learn what they are supposed to say and do, and in what sequence, from a script.

A script is, of course, a procedure. It enables a group of people—

> The Blower Sales Department will first prepare a summary of all blower orders by product. The orders are then edited to conform to our standard sequence and nomenclature. If the customers' orders are accompanied by drawings, or if drawings are needed, the orders are referred to Engineering. Any orders which cannot be properly identified are also referred to Engineering. All the orders are priced at the time of editing and extensions and totals are entered. Shipping date is also entered according to customer's request. This procedure should be completed by noon of the day orders are received. The orders are then sent to Production Control for scheduling. Production Control will approve or correct shipping schedule, and indicate the number of production copies needed. Orders are then returned to Blower Sales by 4:00 P.M. the same day, where the schedule will be checked against the customer's requested shipping date to see if it is acceptable. Blower Sales will then deliver orders by 5:00 P.M. to Warehouse Control for recording of warehouse items. Warehouse Control will deliver orders to Stenographic department by 11:00 A.M. the next day.

Figure 3. "Blower Orders," Extract from an Order and Billing Procedure

actors—to work together as a team and to deliver the desired result—a performance.

Why not use the playscript form of writing industrial procedure, as developed by Leslie Matthies? After all, a procedure in industry must also state the roles and their sequence for several people (or units). It tells them how to "get into the act." (A procedure covering the work of just one person is properly called a *job outline*.)

Mr. Matthies' idea works extremely well.

Consider Figure 3, instructions on blower orders from an Order and Billing Procedure. While not as high flown as the "Format for Procedures," it shows a family resemblance. In both, the sentence patterns are elegant and varied, but they lack the clarity and economy essential for instructions.

Now look at Figure 4. This translates the blower-sales procedure into playscript form. The revision runs 94 words—half the length of the unappealing original. Attractive as this advantage is in itself, the playscript

RESPONSIBLE UNIT	ACTION
Blower Sales	1. Summarize blower orders by product. 2. Edit orders to conform to Zilch sequence and nomenclature. 3. Refer to Engineering all orders: a) accompanied by drawings; b) requiring drawings; c) improperly identified. 4. Enter unit prices, extensions, totals. 5. Enter customer's requested shipping date. 6. Forward to Production Control *by noon*.
Production Control	7. Approve or correct shipping date. 8. Note number of production copies needed. 9. Return to Blower Sales *by 4 P.M.*
Blower Sales	10. Check shipping schedule for agreement with customer's requested date. 11. Forward to Warehouse Control *by 5 P.M.*
Warehouse Control	12. Record warehouse items. 13. Forward to Stenographic department *by 11 A. M.*

Figure 4. "Blower Orders" in Playscript

also gains in clarity and accuracy by another means.

The separation of "responsible unit" and "action" in this layout is more than a typographical feature. It also assures speedy and precise identification of the two most important factors in any procedure: *Who* does *what*.

Spotting the holes

Notice, too, how the playscript (Figure 4) calls attention to a hole that has been concealed in the original: Item 3 states that the Engineering Department should receive all orders that are accompanied by drawings, that require additional drawings, or that are improperly identified.

But then what happens?

The "Responsible-Unit" column does not indicate that Engineering has any obligation to check, transmit, or even burn such an order. According to this procedure, Engineering *does nothing!* The procedure writer can easily spot this flaw and move to correct it, by adding the engineering department's duties to the playscript. Not only will he write a better procedure, but he'll also avoid a dead end in organization.

Live specimen

When procedure requires filling out a form, a graphic way to explain it is to present a live specimen of the form. There are, in general, two ways:

1. Provide a copy of the form, plus a detailed narrative of what data should be filled in where.
2. Present a replica of a properly filled-out form, with marginal instructions flagged to each item.

Since "showing" is always clearer than "telling," the second alternative is better. Yet, even this risks the hazard of overcommunication, which can be as unfortunate as undercommunication.

Why is it as bad to tell too much as to tell too little? Take a look at Fig. 5, p. 22. Here's a form that is self-explanatory, yet the writer of the instructions has gone to great pains to underline the obvious. The clerk who reads this will quickly realize that *some* of the instructions are needless. She may therefore ignore *all* of them. Then, when she must actually do the job, she has missed the important parts of the instruction—and may make mistakes.

The procedure writer has, in effect, told her she doesn't have to heed his words—and she is all too likely to follow his advice.

Prevent the errors

Actually, the record of errors with a form like this gives the best clue to instruction. We can get a statistical measure of items that are never (or rarely) missed and those that are always (or too often) missed. Then, in our instructions, we can stress only the latter.

This has been done in Fig. 6, p. 23, where areas of probable error

are circled. Notes in the margin make the explanations that are necessary. A new clerk can check this instruction sheet at a glance, read four important notes, and then be prepared to turn out good work.

In short, communicate only what *needs* communication.

To test the soundness of that proposition, compare Figures 5 and 6. Ask yourself, "If I were the clerk doing the job, which version would I read most attentively?"

The "wordless wonder"

The most succinct way of all for presenting a procedure is the matrix. It might be called "the wordless wonder," for it is essentially a chart that conveys information by its table format rather than by sentence structure.

A common example of a matrix is the railroad timetable. Trains are listed across the top; the cities they pass through are listed down the side. To find what time you can expect to arrive at your destination, look down the vertical column (headed by the name or number of the train that you're traveling on). Where the vertical and the horizontal meet, a time is listed—the time your train is due at your destination.

The same format can be applied industrially (see Fig. 7, p. 24). This is a procedure for showing order clerks the transportation terms they should specify for shipments from one company division to another.

For example, a clerk may process an order that requires shipping goods from the Bay City Specialty Products Plant to the Midland Division. She finds the former listed as the third item down the side, under "Shipping Points." She finds Midland listed in the column across the top—"Receiving Points." Where the horizontal and vertical meet, there is the letter *D*. The legend—or key—explains what *D* means: The shipment should be sent "Plant Transfer Collect."

A matrix is especially useful for a procedure that has many variations, according to diverse combinations of factors (which also may vary). In short, a matrix can quickly give instructions that involve many *if*'s, *and*'s, or *but*'s. On the other hand, if the same procedure were to be written in narrative form, it almost inevitably would be a dull and perplexing tangle of subparagraphs with endless exceptions.

Handling the variables

Consider, for example, the problem faced by a research-and-development supervisor. He wanted to prepare a procedure that explained the specific tolerances of one machine. But the machine is composed of five systems, each of which averages five components. Every component has a specific tolerance for each of the four tests that are given the machine—50-hour, 100-hour, 200-hour, and 500-hour. This amounts to over 100 specific toler-

(Text continues on page 25)

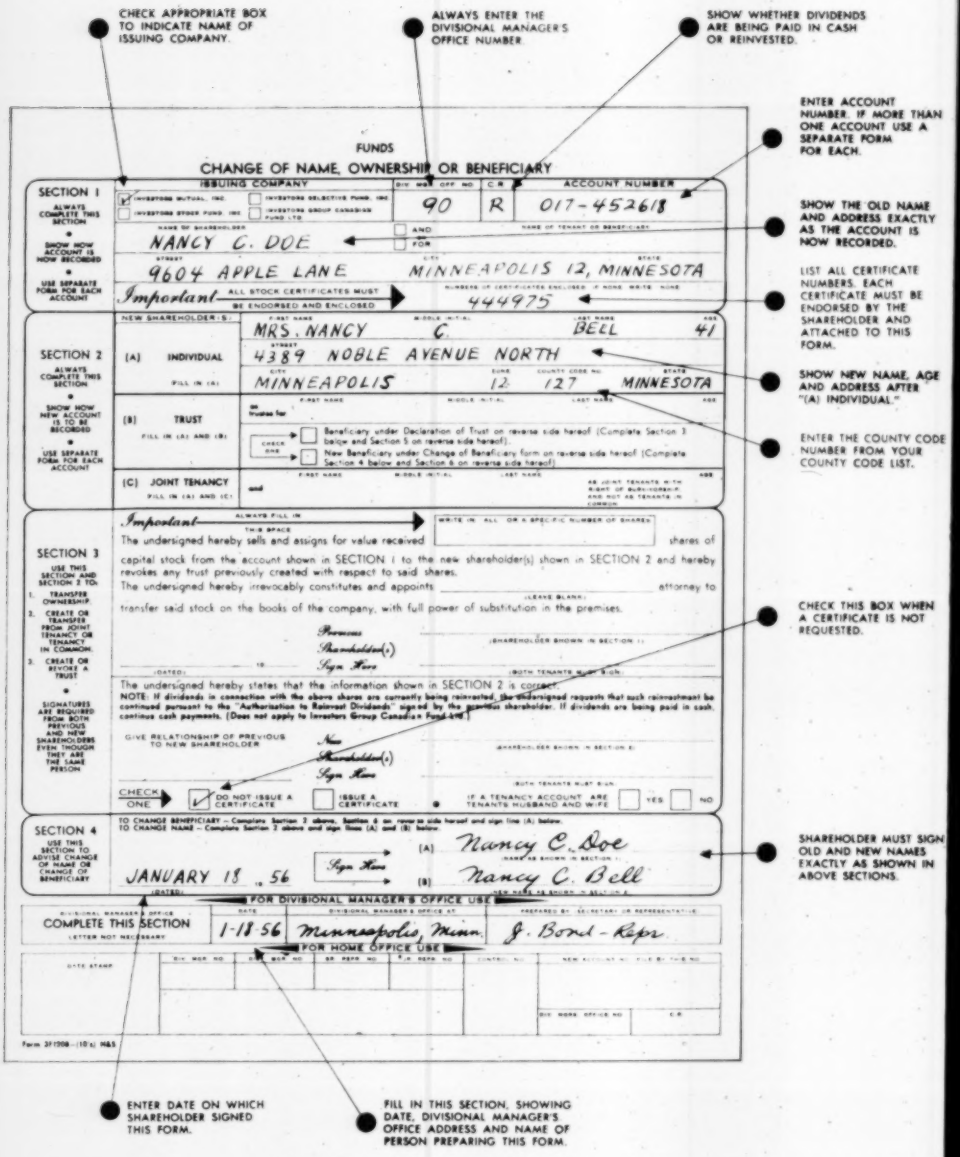
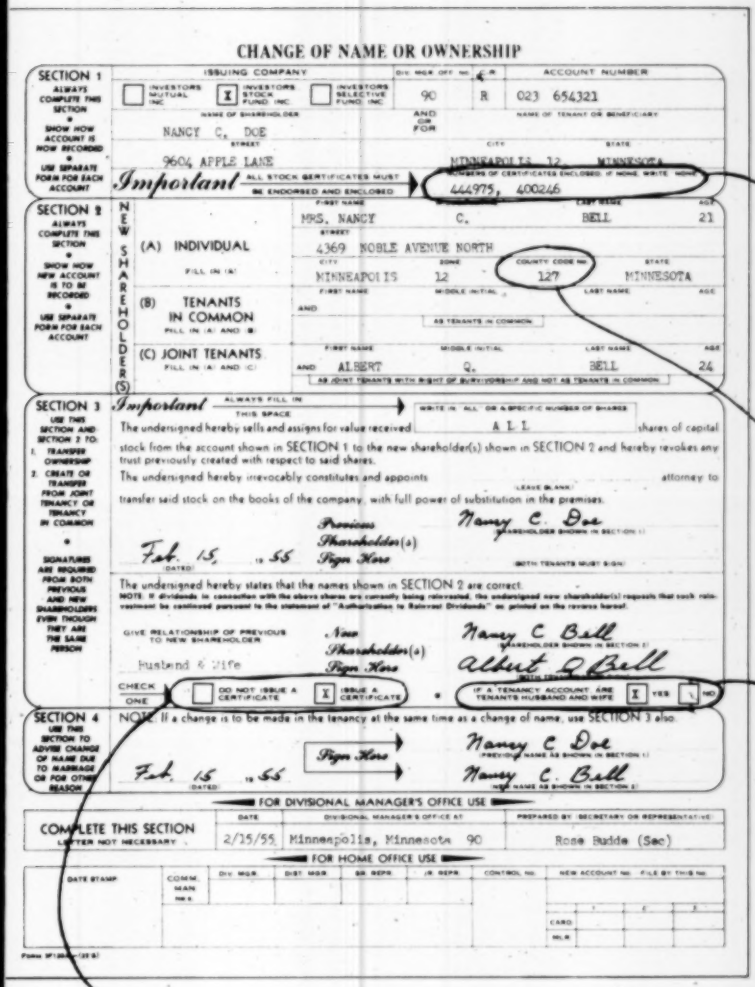

CHECK APPROPRIATE BOX TO INDICATE NAME OF ISSUING COMPANY.
ALWAYS ENTER THE DIVISIONAL MANAGER'S OFFICE NUMBER.
SHOW WHETHER DIVIDENDS ARE BEING PAID IN CASH OR REINVESTED.
ENTER ACCOUNT NUMBER. IF MORE THAN ONE ACCOUNT USE A SEPARATE FORM FOR EACH.
SHOW THE OLD NAME AND ADDRESS EXACTLY AS THE ACCOUNT IS NOW RECORDED.
LIST ALL CERTIFICATE NUMBERS. EACH CERTIFICATE MUST BE ENDORSED BY THE SHAREHOLDER AND ATTACHED TO THIS FORM.
SHOW NEW NAME, AGE AND ADDRESS AFTER "(A) INDIVIDUAL."
ENTER THE COUNTY CODE NUMBER FROM YOUR COUNTY CODE LIST.
CHECK THIS BOX WHEN A CERTIFICATE IS NOT REQUESTED.
SHAREHOLDER MUST SIGN OLD AND NEW NAMES EXACTLY AS SHOWN IN ABOVE SECTIONS.
ENTER DATE ON WHICH SHAREHOLDER SIGNED THIS FORM.
FILL IN THIS SECTION, SHOWING DATE, DIVISIONAL MANAGER'S OFFICE ADDRESS AND NAME OF PERSON PREPARING THIS FORM.
FUNDS
CHANGE OF NAME, OWNERSHIP OR BENEFICIARY
SECTION 1
ISSUING COMPANY
DIV. MGR. OFF. NO.
C.R.
ACCOUNT NUMBER
90
R
017-452618
NANCY C. DOE
4604 APPLE LANE
MINNEAPOLIS 12, MINNESOTA
Important — ALL STOCK CERTIFICATES MUST BE ENDORSED AND ENCLOSED
444975
SECTION 2
NEW SHAREHOLDER(S)
(A) INDIVIDUAL
MRS. NANCY C. BELL 41
4389 NOBLE AVENUE NORTH
MINNEAPOLIS 12 27 MINNESOTA
(B) TRUST
(C) JOINT TENANCY
SECTION 3
Important — ALWAYS FILL IN THIS SPACE
The undersigned hereby sells and assigns for value received shares of capital stock from the account shown in SECTION 1 to the new shareholder(s) shown in SECTION 2 and hereby revokes any trust previously created with respect to said shares.
The undersigned hereby irrevocably constitutes and appoints attorney to transfer said stock on the books of the company, with full power of substitution in the premises.
Witness
Shareholder(s) Sign Here
The undersigned hereby states that the information shown in SECTION 2 is correct.
NOTE: If dividends in connection with the above shares are currently being reinvested, the undersigned requests that such reinvestment be continued pursuant to the "Authorization to Reinvest Dividends" signed by the previous shareholder. If dividends are being paid in cash, continue cash payments. (Does not apply to Investors Group Canadian Fund Ltd.)
GIVE RELATIONSHIP OF PREVIOUS TO NEW SHAREHOLDER
CHECK ONE
DO NOT ISSUE A CERTIFICATE
ISSUE A CERTIFICATE
IF A TENANCY ACCOUNT, ARE TENANTS HUSBAND AND WIFE
SECTION 4
TO CHANGE BENEFICIARY – Complete Section 3 above, Section 6 on reverse side hereof and sign line (A) below.
TO CHANGE NAME – Complete Section 3 above and sign lines (A) and (B) below.
Sign Here
(A) Nancy C. Doe
JANUARY 18, 56
(B) Nancy C. Bell
FOR DIVISIONAL MANAGER'S OFFICE USE
COMPLETE THIS SECTION
1-18-56 Minneapolis, Minn. J. Bond - Repr
FOR HOME OFFICE USE
Form 2F1208—(10c) H&S

Figure 5. From a Sales Manual



CHANGE OF NAME OR OWNERSHIP

SECTION 1 — ALWAYS COMPLETE THIS SECTION • SHOW HOW ACCOUNT IS NOW RECORDED • USE SEPARATE FORM FOR EACH ACCOUNT

ISSUING COMPANY: [ ] INVESTORS MUTUAL, INC. [X] INVESTORS STOCK FUND, INC. [ ] INVESTORS SELECTIVE FUND, INC.

DIV. MGR. OFF. NO. 90 | A/C R | ACCOUNT NUMBER 023 654321

NAME OF SHAREHOLDER: NANCY C. DOE

AND OR FOR

NAME OF TENANT OR BENEFICIARY

STREET: 9604 APPLE LANE

CITY: MINNEAPOLIS 12 STATE: MINNESOTA

Important — ALL STOCK CERTIFICATES MUST BE ENDORSED AND ENCLOSED

NUMBERS OF CERTIFICATES ENCLOSED: IF NONE, WRITE "NONE": 444975, 400246

SECTION 2 — ALWAYS COMPLETE THIS SECTION • SHOW HOW NEW ACCOUNT IS TO BE RECORDED • USE SEPARATE FORM FOR EACH ACCOUNT

NEW SHAREHOLDER(S)

(A) INDIVIDUAL — FILL IN (A)

FIRST NAME: MRS. NANCY | MIDDLE INITIAL: C. | LAST NAME: BELL | AGE: 21

STREET: 4369 NOBLE AVENUE NORTH

CITY: MINNEAPOLIS | ZONE: 12 | COUNTY CODE NO.: 127 | STATE: MINNESOTA

(B) TENANTS IN COMMON — FILL IN (A) AND (B)

FIRST NAME | MIDDLE INITIAL | LAST NAME | AGE

AND

AS TENANTS IN COMMON

(C) JOINT TENANTS — FILL IN (A) AND (C)

FIRST NAME: AND ALBERT | MIDDLE INITIAL: Q. | LAST NAME: BELL | AGE: 24

AS JOINT TENANTS WITH RIGHT OF SURVIVORSHIP AND NOT AS TENANTS IN COMMON

SECTION 3 — USE THIS SECTION AND SECTION 2 TO: 1. TRANSFER OWNERSHIP 2. CREATE OR TRANSFER FROM JOINT TENANCY OR TENANCY IN COMMON • SIGNATURES ARE REQUIRED FROM BOTH PREVIOUS AND NEW SHAREHOLDERS EVEN THOUGH THEY ARE THE SAME PERSON

Important — ALWAYS FILL IN THIS SPACE

The undersigned hereby sells and assigns for value received WRITE IN "ALL" OR A SPECIFIC NUMBER OF SHARES: ALL shares of capital stock from the account shown in SECTION 1 to the new shareholder(s) shown in SECTION 2 and hereby revokes any trust previously created with respect to said shares.

The undersigned hereby irrevocably constitutes and appoints LEAVE BLANK attorney to transfer said stock on the books of the company, with full power of substitution in the premises.

Previous Shareholder(s) Sign Here: Nancy C. Doe (SHAREHOLDER SHOWN IN SECTION 1)

DATED: Feb. 15, 19 55 (BOTH TENANTS MUST SIGN)

The undersigned hereby states that the names shown in SECTION 2 are correct.

NOTE: If dividends in connection with the above shares are currently being reinvested, the undersigned new shareholder(s) requests that such reinvestment be continued pursuant to the statement of "Authorization to Reinvest Dividends" as printed on the reverse hereof.

GIVE RELATIONSHIP OF PREVIOUS TO NEW SHAREHOLDER: Husband & Wife

New Shareholder(s) Sign Here: Nancy C Bell (SHAREHOLDER SHOWN IN SECTION 2); Albert Q Bell (BOTH TENANTS MUST SIGN)

CHECK ONE: [ ] DO NOT ISSUE A CERTIFICATE [X] ISSUE A CERTIFICATE

IF A TENANCY ACCOUNT, ARE TENANTS HUSBAND AND WIFE? [X] YES [ ] NO

SECTION 4 — USE THIS SECTION TO ADVISE CHANGE OF NAME DUE TO MARRIAGE OR FOR OTHER REASON

NOTE: If a change is to be made in the tenancy at the same time as a change of name, use SECTION 3 also.

Sign Here: Nancy C. Doe (PREVIOUS NAME AS SHOWN IN SECTION 1)

DATED: Feb. 15, 19 55

Nancy C. Bell (NEW NAME AS SHOWN IN SECTION 2)

FOR DIVISIONAL MANAGER'S OFFICE USE

COMPLETE THIS SECTION — LETTER NOT NECESSARY	DATE	DIVISIONAL MANAGER'S OFFICE AT	PREPARED BY (SECRETARY OR REPRESENTATIVE)
	2/15/55	Minneapolis, Minnesota 90	Rose Budde (Sec)

FOR HOME OFFICE USE

DATE STAMP	COMM. MAN NO.	DIV. MGR.	DIST. MGR.	SR. REPR.	JR. REPR.	CONTROL NO.	NEW ACCOUNT NO.	FILE BY THIS NO.
							CARD	
							MLR	

Form SF1[illegible] (12 5)

List all certificate numbers. Each certificate *must* be endorsed by the shareholder and *attached* to this form.

Enter the county code number from your county code list.

When a tenancy account is established, always check one of these boxes.

Always check one of these boxes.

Figure 6. From a Sales Manual

KEY FOR INDICATING UNIT PRICE AND TRANSPORTATION TERMS
on Sales Orders and Invoices

For Consignment (CGN), Interdivisional Transfers (IDT) and Plant Transfer (PT) Shipments

Ship "I.D.T. COLLECT" - Except as Indicated by Code

SHIP FROM \ SHIP TO		RECEIVING POINTS																								
			Bay City														Terminals					Western				
		Allyn's Point	Magnesium	Specialty Products	Bay Plant	Bay Refining	Dobeckmun	Dowell	Hanging Rock	James River	Louisiana	Ludington	Madison	Midland	Riverside	Central	Eastern	Southern	Western	Texas	Pittsburg	Seal Beach	Torrance	Framingham Lab
SHIPPING POINTS	Allyn's Point Plant	B														A	A	A	A					A
	Bay City — Magnesium		B													A	A	A	A					A
	Bay City — Specialty Products			B										D		A	A	A	A					A
	Bay City — Bay Plant				B											A	A	A	A					A
	Bay City — Bay Refining					B										A	A	A	A					A
	Dobeckmun Division						X									A	A	A	A					A
	Dowell Division							D								A	A	A	A					A
	Hanging Rock Plant								B							A	A	A	A					A
	James River Division									B						A	A	A	A					A
	Louisiana Division										B					A	A	A	A					A
	Ludington Division											B				A	A	A	A					A
	Madison Division												B			A	A	A	A					A
	Midland Division		C											B		A	A	A	A					A
	Riverside Plant														B	A	A	A	A					A
	Terminals — Central															C	A	A	A					A
	Terminals — Eastern															A	C	A	A					A
	Terminals — Southern															A	A	C	A					A
	Terminals — Western															A	A	A	C					A
	Texas Division															A	A	A	A	B				A
	Western Division — Pittsburg															A	A	A	A		B	D	D	A
	Western Division — Seal Beach															A	A	A	A		D	B	D	A
	Western Division — Torrance															A	A	A	A		D	D	B	A
	Framingham Laboratory															A	A	A	A					B

LEGEND

A - Ship "IDT PREPAY & ADD"
B - Ship "PLANT TRANSFER"
C - Ship "PLANT TRANSFER PREPAID"
D - Ship "PLANT TRANSFER COLLECT"
X - Ship on schedule established by Division.

NOTE - Ship all marine movements (ship & barge) "IDT PREPAY & ADD"

SPECIAL SHIPMENT CATEGORIES

Samples Shipped for Evaluation		"No Charge Prepaid"
Consignment Shipments	Into	(See chart on page 701-2-2)
	Out Of	(See chart on page 701-3-4)
Shipments To--	Associated Companies	Charge and ship using the regular consumer schedule
	Export Companies	Charge and ship according to schedule established by Accounting Department
	Rocky Flats	Charge and ship using the regular consumer schedule
	Subsidiaries (Except Export)	Charge and ship using the regular consumer schedule
Adams Paper Co.		Ship "IDT COLLECT" - Invoice: Dobeckmun Division, Cleveland
Ben-Mont Paper Co.		Ship "IDT COLLECT" - Invoice: Dobeckmun Division, Cleveland

Figure 7. The Matrix

ances, according to the part and the test.

The supervisor carefully wrote the procedure in narrative form and, after a lot of hard work, was able to condense it into eight pages. Actually, it was a neat job, he thought—until some asked why he had wasted seven pages!

He caught on quickly, however, and soon had the information on one page. Across the top, he listed the four tests: "50-hour," "100-hour," and so on. Down the left margin, he listed all components. And in the squares (where component and test converged), he listed the appropriate tolerances.

"Easy—when you know how," he said with understandable satisfaction.

Serendipity

Not only did his new version do a better job than his eight-page version, but it also led to an improved form for reporting test results: the same matrix with the same captions and labels, but with squares left blank. Testers simply enter the results in the appropriate spaces. Previously, test results were submitted in many sizes—and arrangements. Now they are all in the same form, and the supervisor can check them at a glance. A nice example of serendipity.

To get voluminous instructions so well in hand that they can be listed on one page requires real organizational skill. Abstract relationships must be translated into a concise and concrete chart. Once the supervisor has his data listed precisely, however, a good designer of stationery forms can help him convert it into a matrix like that in Figure 7.

It's up to you

Perhaps it's evident now that, even in writing procedures, it is possible to write less, yet say more. Whatever job he wants to explain, the supervisor needs only a little imagination—to condense, to simplify, and to clarify.

Perhaps, however, you are now saying, "These ideas are fine—but they won't work for *my* procedures!"

To which there is just one answer: "Have you tried?" ♦

THE TRAIL OF BUSINESS PROGRESS is littered with the debris of outworn management devices. . . . Plans, systems, and concepts have a rate of obsolescence, just as a piece of machinery does . . . Originally serving appropriate purposes, they tend to become encrusted with habit and tradition to a point where they actually become deterrents to fresh thinking.

—M. P. McNAIR

OFFICE COST CONTROL: Get Rid of the SACRED COWS!

By Arthur Barcan

Executive Director
Records Management Institute

To cut office costs, take a sharp look at The Way Things Have Always Been Done.

WHENEVER A PROGRAM for reducing office costs is proposed, it seems to evoke extremes of moral fervor and crusading righteousness. Many a new technique has been hailed as the package solution: reports control, work measurement, integrated data processing, mechanization, and "electronification."

Yet, despite the spiraling number of devices, and despite also an increasing emphasis on cost cutting, companies are spending more money for paperwork than ever before.

The fact is that the new techniques are often used to cut the costs of operations that are either unnecessary or too complicated for the purpose they serve. If we are to cut costs, we've got to get rid of these operations—these "sacred cows" that impede the progress of paperwork.

The "wasted-dollars" mystery

In 1958, the American Management Association held its first "Paperwork for Profits Clinic," directed by Records Management Institute, in which two paperwork cycles were reviewed: 1) The processing of purchase orders through accounts payable; and 2) the processing of customer orders through accounts re-

ceivable. The participants, who represented leading companies in various industries, were shocked to learn that they were exceeding the standard unit cost for a purchase order—$3.53, broken down this way:

Preparation of purchase order (including purchase requisition)	$1.10
Preparation of receiving report and purchasing follow-up	.43
Preparation of voucher and AP analysis	1.60
Stationery forms (for entire cycle)	.40
TOTAL	$3.53

The companies represented at the clinic had actual unit costs ranging from $5 to $12!

The rest of the clinic was devoted to finding out where the cost leaks for each company occurred. In every case, the mystery of the wasted dollar could be solved. It should be stressed that all the participants were using modern integrated paperwork procedures such as punched tape. Yet many obsolete practices had been integrated into their new systems.

Obsolete practices

Here are some examples:

1. Requisitions for purchase orders were being prepared for everything but standard stock items. Most of the requisitions submitted by the material-control department, however, could have been eliminated —with no loss of control, but with improvement in quality.

2. Acknowledgements were being requested and followed up in every case. This actually hindered the job of expediting and control and made it more expensive.

3. To insure completion, every purchase order was being checked from start to finish, not only in the purchasing and accounts-payable departments, but also in production and material control.

4. The accounts-payable department conducted between 25 and 50 per cent more matching operations than were actually required.

5. Receiving departments wrote, transcribed, or computed far more than the job required (which produced higher costs) and also in some instances more than they were qualified to handle (which introduced greater errors).

These are just a few examples of areas where money could have been saved, without the purchase of any new equipment. And these savings would probably lead to improvement in quality as well.

Yet, in the sophisticated transition from manual to mechanical to punched-card and electronic processing, these obsolete practices were preserved. No wonder the new equipment had not fulfilled its potential promises for cost reduction!

Cows that keep costs up

Buried in the welter of competitive claims for all kinds of duplicating devices, punched cards, and even "plain old interleaved carbon

forms" is a whole series of practices that keep up the unit cost, no matter what system is used. Some companies, seemingly following the lemming's law of self-destruction, insist on losing money on small orders rather than modify their procedures.

Let's take a look at some areas where getting rid of the sacred cows could make a big difference in cost and quality.

The sacred cow of personnel

Personnel management is one important area. Job specifications for routine, repetitive clerical operations continue to call for bright, ambitious, curious, skilled employees. But if these people are filling monotonous jobs, their brightness may encourage early boredom; their ambition may stimulate a wandering eye for greener pastures; and their curiosity may lead them to question just when all their required skills are going to be used. The result is lowered productivity.

How to solve this problem? There are at least two alternative approaches. Either increase the amount of interest and opportunity in the jobs, or—if these are really routine jobs that lead nowhere—don't insist on hiring overqualified people.

Quality control

Quality control is pretty firmly established in the factory. The production man knows that quality doesn't mean 100 per cent perfection. But in the office, layer upon layer of inspection is imposed, in an effort to reduce errors. These layers of inspection build up impressive statistics on the errors caught each day, but they do little or nothing to eliminate the causes of these errors.

The same quality-control procedures used in plants can work in the office, too, to establish realistic standards for cost and quality. Through such procedures * we can establish just how accurate it pays to be. Also, we can often pinpoint and eliminate the factors that cause most of the errors.

Common sense

Some people, of course, feel that scientific methods of handling paperwork don't hold a candle to the do-it-yourself approach. This approach goes on the assumption that "anyone with common sense" can tackle all problems as long as he's read an article or two on forms control and attended a couple of sessions on filing.

Undoubtedly, there are many instances in which common sense and intuition have saved the day. But how do you use unaided common sense to select from hundreds the one piece of equipment best suited to your needs? How do you use common sense to decide what specifications are needed, and in what order to rank these needs—let alone mak-

* See *Cut Costs with Quality Control*, by Arthur I. Heim, Jr., SM, January, 1959.

ing sure that you've even considered all the available equipment?

Common sense is a valuable asset—and few people will admit to being without it. It's also invaluable in medicine—but, we hope, a doctor wouldn't try to practice medicine on the strength of common sense alone.

The almighty folder

From the early days of manuscript paper until today, office progress seems to have been measured in terms of how many additional papers we can accumulate within the confines of one folder, and how many additional folders within one records container. We are no longer content with folders revealing only name and number. We have designed complementary records on vertical cards, visible cards, punched cards, and the like.

Now, since we have augmented the folder with so many aids, some spoilsport may suggest modifying the use of the folder itself. But that approach is entirely too radical. It just wouldn't be fair to take a really close look at, let's say, the personnel folder. It's such a handy item. For one thing, the folder holds in perpetuity all the initial reference checks. These letters, which verify what the employee originally told us, would have to be thrown away if we didn't have the handy folder.

We also post all personnel changes onto some kind of payroll or personnel card. Once these changes are approved, processed, and audited, they too would have to be thrown out, were it not for our handy folder. Luckily, about 10 per cent of the folder may be essential—like the last merit rating, letters of commendation, and warnings. And once we have the folder for 10 per cent of the papers, why be choosy—why not include the other 90 per cent, too?

Scores of companies or departments within companies might get by just with the data posted on the personnel card record—but that would be unthinkable. The next thing we knew, many offices would be working only with nonbulky records con-

No Free Rides

OFFICE MANAGEMENT must seek to dispel whatever remains of the misconception that the office is simply "overhead"—a sort of free-riding (or at least, poorly paying) passenger. We who are responsible for office management today must strive to make it an important and contributing partner, working and producing for profit, just as the other departments of our companies are, and operating toward that end in an economically controlled and efficient manner.

—NORMAN J. BROWN
Comptroller, The Steel Company of Canada

veniently near the person maintaining them. There would no longer be those familiar banks of file cabinets. The office would look strange and empty; we might even have to use partitions instead of files to divide the work space. There is such a thing as going too far.

Cows in the files

Nothing typifies the sacred-cow problem as well as our traditional manner of filing records: We read records from top to bottom, but we file them sideways.

This not only causes neck craning—an occupational hazard among file clerks—but also wastes equipment and space.

Reporting

Reporting has always been an area where the sacred cows are well entrenched. The nice part about reporting is that everyone can get into the act. There are the reports top management has asked for, some reports it once asked for and forgot to stop, and some that "have always been prepared."

Distributing reports is the same kind of problem. Since the introduction of carbon paper and duplicating processes, it is always a matter of prestige to see that you get on all the important distribution lists, and a matter of courtesy for the preparer of the report to go along with such requests. Every once in a while, some eager beaver will attempt to cut down his list by sending out a questionnaire about who really needs this report. The resulting list usually ends up longer than ever: Someone who was not on it before suddenly discovers the oversight and demands corrective action.

In dollars and cents, these are large overhead costs that usually grow by default, expand with ambition, and continue with inertia.

Cows and costs

Even the process of cost cutting itself has its sacred cows. In companies where factory-production costs are computed down to each nut and bolt, total paperwork costs are lumped into miscellaneous overhead expenses. The only time we break down, post, and process costs is for items like labor and material.

We'd learn a lot from a cost breakdown: For example, the average company should maintain no more than 2,000 pieces of paper for every person on the payroll. Processing these records at a conservative 20 cents apiece creates an overhead cost for paperwork alone of $400 per year (equipment, supplies, personnel, etc.) for every man on the payroll. Multiply these figures by 10 for accounting offices or by 5 for personnel and purchasing offices that carry out concentrated paperwork operations. There is 65 cents' waste in the average dollar spent for paperwork today.

But you can't go ahead and cut costs without knowing your present costs. You might just as well dis-

cuss health in terms of "temperature reduction." Determining how much something *now* costs and how much it *should* cost creates a tangible target and a basis for prompt action by the office manager.

Replacing sacred cows with science

There are many challenging possibilities for analysis and standards improvement, but any such analysis must be in terms of functional requirements that minimize the sacred cows of departmental desires and traditional paperwork "needs."

Scientific records management makes it possible not only to rate paperwork operations within one to two days, but to make improvements in a comparably short time. There's no need to wait for months to know what remains to be done or how to do it. ♦

The Rage for Beige

BEIGE, THE NATION'S 1958 color favorite, will extend its reign throughout 1959, according to Faber Birren, color consultant to Monsanto Chemical Company's Plastics Division. This noted authority predicts that the remainder of the top ten consumer color preferences will be, in order of popularity: sandalwood, pink, oyster white, light green, turquoise, light blue, yellow, light gray, and rose.

As Birren sees it, the shift in consumer color preference is toward the more refined and muted hues; America is still in a "pastel era" that began in about 1956 when the dark and vivid colors fell from favor. Beige and sandalwood rode in on a current trend that is now pulling up subdued tones of rose, brown, and gold. Meanwhile, pink, light gray, and light green—the big three of 1955—are clearly giving ground.

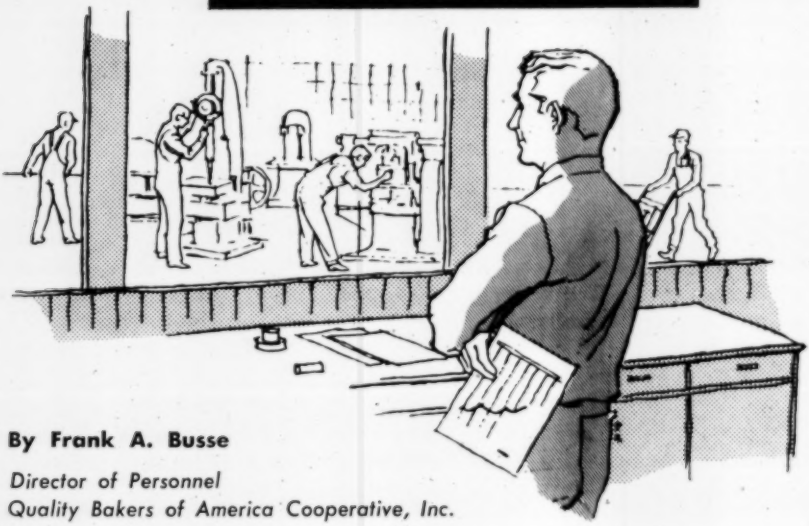
Birren's predictions are based on actual records of consumer sales; since 1946, he has been tabulating and analyzing sales figures on a number of retail products, including paints, wallpapers, fabrics, carpeting, appliances, housewares, and miscellaneous plastic goods.

Here are some of his other observations: Ivory, which in 1946 accounted for more than half of all demand in ready-mixed paints, has fallen badly. Dark green and chartreuse, so popular years ago, have virtually disappeared. Dark gray (charcoal) has risen, descended, and returned in the form of taupe in the past ten years. And orange, despite vigorous promotion, has never made the grade—and probably never will.

—*Manufacturing and Industrial Engineering*

MAKE THE MOST OF YOUR MANPOWER

Part 3: MOTIVATION



By Frank A. Busse

Director of Personnel
Quality Bakers of America Cooperative, Inc.

What does it take to build the morale that is required for peak performance?

LET'S ASSUME that you've either selected or inherited a competent workforce. Furthermore, you've seen to it that your men are trained to do their jobs, and that they will get more training as they need it.

Can you now relax in the certainty that from here on, this group of employees will cooperate wholeheartedly with company objectives, and will do the best job possible? As you probably realize from experience, the answer is no.

If you were a machine tender instead of a supervisor, your principal job would be over. An automatic machine has a rated capacity. Install the machine, supply the material, turn on the switch, and the machine delivers X units per hour—no more, no less.

But people don't have switches or

rated capacities. People who are unhappy (or even just bored) can goof off, slow down, or quit. And under better circumstances, the same people can team up to get a tough job done, perform way over their heads to meet an emergency, use their own time to think up improvements on the job.

The things money can't buy

Cooperation of this sort can't be bought, but it can be earned.

Money will buy a certain amount of employee services. For his pay check, a man will usually exert some stipulated physical and/or mental effort. Anything beyond this minimum comes under the heading of morale, enthusiasm, motivation.

Motivation comes basically from within. Some people are almost entirely self-motivated; no discouragement seems to stop them from striving toward their goals.

The strongest influence

But for the majority, motivation is strongly affected by what happens on the job. And the supervisor—the day-by-day representative of management—is the strongest influence of all.

How can a supervisor favorably influence motivation? From the employee's point of view, the best supervisor is the one who *helps* him satisfy his needs and achieve his goals. The word "help" is important. People with a normal amount of independence don't want to be handed achievement on a silver platter. But they do want a boss who will help them get what they are after.

Just what goals are they striving for? On the surface, these may seem varied. One man will sacrifice everything for security; another will put up with considerable risk in order to obtain more opportunity. Yet there are basic on-the-job goals that most employees have in common, even though the importance of each goal varies with the individual. The supervisor should keep these goals in mind.

Triple view

He should realize also, however, that on the job no one functions only as an individual. Each employee sees the job situation from at least three points of view—as himself; as a member of his "gang" or informal organization; and as an employee of the company. He may at times find himself in serious conflict when there is a conflict of interest among these groups: when his interests as an individual, for example, collide with the customs or wishes of the group. Every employee likes to be praised for a job well done. Yet in some situations, he may not like to have this praise given in front of his gang—certainly not if it's going to cause them to classify him as an apple polisher.

No supervisor can ever expect to attain a perfect situation of goal achievement or need satisfaction

HOW WELL MOTIVATED ARE YOUR SUBORDINATES?

Check what you know about your subordinates' feelings with these statements of the way an employee would feel under ideal circumstances; i.e., if all his needs on the job were being met.

BASIC NEEDS ON THE JOB	As an Individual	As a Member of the Work Group	As a Company Employee
A good living	I make a good living when you consider my effort and skill. The pay is O.K.	The pay for the gang is not all the same; but mine compares all right. If we all pitch in, we can earn more.	Our pay is as good as any in this town for this kind of work. And we'll do better as the company does better.
Good working conditions	The shop is well run and well maintained. My boss is fair, and he's capable.	The gang are my friends. We relieve each other for breaks—and help each other in general. We get along fine with the boss.	This company does everything it can to make us proud to work here. They deserve our support.
Opportunity to advance	My boss wants me to be in line for better jobs and he gives me a chance to use my ability.	If I earn a promotion, the gang will support me.	The company's policy is to promote from within. I know if I try hard enough, I can get somewhere.
Being "in the know"	My boss lets me know where I stand and how I can do better. He pays attention to my suggestions and gripes.	The boss lets us know about things that affect us. He listens, too.	Top management shoots it straight, good or bad, all the time.

Confidence in management	My boss is fair, he's friendly, and he's helpful. He knows his job, and *his* boss likes him.	Our supervisor does a good job with the group. He understands us and will go to bat for us.	The top boys know what they're doing. They keep their promises and consider how we feel.
Feeling he counts	My boss knows my ability and uses it. I get credit for good work and good ideas.	The gang likes to have me around.	Top management isn't afraid to say thanks when we deserve it. And we get a chance to discuss changes that affect our jobs.
Doing his part	What I do makes a difference to the total product—and also to the next man who works on my stuff. My ideas are important, too.	I'm on the up and up with the rest of the gang. If it's good for them, it's good for me.	The company must put out a good product and they depend on us for that.
Work that is worth while	Even though it might seem routine, my work is important. That's why I like to do my best.	The guys in the group depend on me and I can count on them.	This company is important—and it's going places. We can help them keep their reputation for good products and for being a good place to work.
A secure future	I have a safe, steady job. I know where I stand; my boss lets me know how I'm doing and what's expected of me.	The gang hangs together. No unnecessary fights or grudges. If a man is in trouble, we'll lend him a hand.	The company recognizes long service and has good benefits. They are also good at maintaining steady work. It's a good place for a family man.

among his employees. He can try, however, to satisfy the needs that seem to be most important to each employee.

The table on pages 34 and 35 gives nine basic goals that most employees are trying to attain, with a statement that the employee might make about each one of them—as an individual, as a group member, and as a company employee.

The toughest leg of the tripod

Motivation is not easy—in fact, it's the most difficult leg of the manpower tripod. Furthermore, it is a continuous job; you have to keep plugging at it.

There is a helpful key question that a supervisor can ask himself periodically. It is this: "What am I doing right now to help my people get the satisfactions that I know they need." ♦

This is the conclusion of a three-part series on making the most of manpower. The two previous articles dealt with selection and training.

Look Better—Work Safer

WANT TO LOOK BETTER, feel better, get work done with considerably less fatigue and greater safety? Good posture and learning to move properly can do all these for you and eliminate the nervous tension and irritability that are so often the results of a busy day. Industrial engineers have found this to be true in the factory and the office, and at home, too.

Use your body correctly. Stand on both feet, with your head, neck, chest, and abdomen balanced vertically so that your weight is borne evenly by the bony framework. Keeping your body poised so you can move in any direction will prevent falls and strains when sudden movement is necessary. Do not lock your knees, but keep them slightly flexed and easy. Sag and slump only increase strain on ligaments and muscles.

Sit with your body straight from neck to hips—no back hump or bend at the waistline—and with feet flat on the floor. If the chair is too high so that your legs dangle, use a footstool.

Bend at the knees or hips, but not the back; back bending is back breaking. To lift an object, bend your knees and use your leg muscles rather than back muscles. If you push a heavy object, use your whole body to apply the pressure at the center of the weight to be moved.

Your job may require that you *swing around* from side to side in an arc of 90 degrees or more. Do not twist around—but move your feet so you turn your whole body at once, or use a swivel chair.

Correct working heights lighten the job. Whenever possible, stand erect, sit to do your work, and keep things within easy reach.

—Greater New York Safety Council

By whose Authority?

By Eugene S. Marble

Columbia-Southern Chemical Corporation
(Subsidiary of Pittsburgh Plate Glass Company)

Status may come with the job, but stature depends upon the manager himself.

NO MAN is a completely free agent. Everyone must yield to some kind of higher authority—everyone, that is, who wants to get along with other people.

What is authority? It is the privilege of directing the activities of others. All our lives, we accept some direction from outside authorities—in our private lives, as part of a community, on the job. And, as an important part of maturing, each of us in turn accumulates some authority over others.

If we are to use this power wisely, we must know and understand it. But this doesn't come easily; consider the number of times authority is misused or unused in business.

All authority is based in the first instance on acceptance. For example, our entire system of laws and ownership works as well as it does because basically it is accepted by most people. Laws not accepted by the majority fall into disuse or are repealed.

Types of authority

There are two general types of authority that enter into supervision: personal authority and positional authority.

Personal authority depends directly and immediately on acceptance. It is based on personal qualities: skill, character, experience. It reflects the respect other people have for us; and it is usually developed over a considerable length

of time. Age itself, other things being equal, carries authority; so does success in life.

We speak of another person as an "authority" on a certain subject; and we know that there are some areas on which we can speak "with authority." Interestingly enough, when a person has become an authority in one field, people tend to accept him as an authority in other fields that may be totally unrelated to his specialty.

The second type of authority, *positional authority,* is tied to a person's job or position, and (unless he is the owner of a business) is conferred on him by others. It is the authority to make certain decisions or to take action, in order to carry out the responsibilities of an assignment.

Positional authority is delegated or assigned by the people to whom it originally belongs. That is, it is based on ownership authority, which in turn is based on the law. It is important to recognize the sources of this authority.

Legal authority

In a democracy, in order to establish secure communities, the people delegate certain personal rights to their elected representatives. These representatives establish a body of law that is, in general, acceptable to the people. They also delegate or assign part of their authority to others. For example, a mayor delegates the authority and responsibility to maintain order to a police commissioner—who in turn delegates to policemen.

In other words, we agree on rules of conduct, establish them as law—either by direct vote or by our elected representatives—and also elect or appoint people to enforce them. By virtue of their position, these people have authority over our behavior in matters covered by the law. We have exchanged some of our personal freedom for the security of living in a lawful community.

> A chain of command may exist without a chain of understanding.
>
> —D. M. Snow,
> Director of Industrial Relations
> Halomar Electronics Company

People have agreed to eliminate the use of force to decide personal disputes over property boundaries, debt payments, and the like. They have agreed to accept instead the judgment of a third party or jury. In this way, we limit the authority of physical strength and ensure that the weak, as well as the strong, may enjoy their rights.

Authority by ownership

The authority to own things and administer their use is supported by the law. We can decide to whom we'll loan our tools, give access to our property, and whom we'll hire to help us use our property for profit.

If a person hires a yardman to help him out on a Saturday, he chooses a man from those looking for work, agrees on a rate of pay in advance, and directs the yardman's efforts for that day.

Thus, ownership gives us the authority to contract for another person's services. This is a fundamental principle of our way of life.

Positional authority

A supervisor's positional authority derives from ownership. In a stock corporation, for example, the collective authority of the many stock owners (who collectively own the company) is transmitted to the board of directors, who transmit it to the president. He distributes this authority throughout the organization. In a typical organization, it might go from president to department head to plant manager or office manager to the first-line supervisor. The supervisor's right to direct work, to hire and fire subject to company policy, and to select, train, and discipline employees, is, therefore, a right assigned originally by the owners of the company—and protected by the law.

Positional authority is the tool handed a supervisor by management to enable him to direct the activities of his subordinates and thus to carry out his responsibilities. Like any other tool, such authority must be used with skill; and like any other tool, it has its limitations.

Personal authority

Now consider the father teaching his son to build and fly a kite, the chemist explaining to the city fathers how to add chlorine to the water supply, the mechanic seeking advice from his boss on a family problem. Here again, in all these cases, is an authority relationship—but one quite different from legal or positional authority.

The son accepts his parent's authority, not just because of a traditional father-son relationship, nor even because of his father's legal authority over him, but mainly because his father has learned a great

Getting Orders Accepted

A PERSON CAN and will accept a communication as authoritative only under four conditions: 1) He can and does understand the communication; 2) at the time of his decision he believes that it is not inconsistent with the purpose of the organization; 3) at the time of his decision, he believes it to be compatible with his personal interest as a whole; and 4) he is able mentally and physically to comply with it.

—CHESTER I. BARNARD
in *The Functions of the Executive*

deal, can explain and illustrate what he knows, and is clearly interested in sharing his knowledge with his son.

The city council seeks out the expert chemist as an authority because of his knowledge, in a field in which the members of the council are strangers.

The mechanic turns to his supervisor for personal guidance because he has confidence in his boss's opinions, and because he knows his supervisor is interested in him as an individual.

Personal authority flows naturally to the person who has insight into problems, has a record of good decisions, is sincerely interested in the well-being of others, and has a fund of specialized knowledge based on successful experience. It flows with little respect for official channels.

Positional + personal authority

It's a well-known fact, for example, that most work groups—or cliques within the groups—have informal leaders. These people usually become informal leaders because they are liked by the group, and because they have demonstrated a willingness to stand up for the group when it needs protection or support. The informal group leader (who has personal authority) may also be the formal group leader, the supervisor (who has positional authority as well). When this happens, the work situation is at its best. The degree to which the two kinds of authority coincide depends on the care with which positional authority has been bestowed, and the degree to which the individual has fulfilled the possibilities of his job.

Transfer of authority

In business, people are promoted, or transferred, or otherwise moved to new jobs. When a man moves up and assumes the positional authority of his predecessor, his personal authority acquired on the former job moves with him. This may create certain problems for both him and his successor.

In the first place, his former subordinates may continue to consult him on important decisions, while giving only token cooperation to the new man. If he permits this to continue, he will have trouble escaping his old job responsibilities and taking on the new ones.

Furthermore, his successor has the problem of responsibility with insufficient authority. He is getting only lip service from people who are reluctant to transfer their loyalty and communications to him.

This situation points up again the important fact that all authority depends on acceptance.

More than a title

The supervisor in a new job has the positional authority granted to him by a superior. The boss announces his new title, moves him to

What Makes Authority Work?

MEN IMPUTE authority to communications from superior positions. This authority is, to a considerable extent, independent of the personal ability of the incumbent of the position. Even though the incumbent may be of limited personal ability, his advice may be superior solely because of his position. This is the *authority of position*.

But some men have superior ability. Their knowledge and understanding, regardless of position, command respect. Men impute authority to such people for this reason only. This is the *authority of leadership*.

When the authority of leadership is combined with authority of position, men who have an established connection with an organization generally will grant authority and accept orders.

Nevertheless, the determination of authority remains with the individual. If these "positions" of authority show ineptness, ignorance of conditions, or failure to communicate, or if leadership fails to recognize its dependence upon the essential character of the relationship of the individual to the organization, the authority may disappear.

—CHESTER I. BARNARD
from *The Functions of the Executive*
© Harvard University Press

the proper office, and backs up his actions. He delegates to the new supervisor the right to give orders, to sign certain papers, to evaluate his subordinates, to approve or deny requests. Except in extreme cases, most of his subordinates will recognize and accept this positional authority.

But a man cannot build outstanding success as a supervisor on the performance of these formal duties alone. He needs more than the obedience of his subordinates.

A supervisor is successful when he has developed a low-cost, high-efficiency, high-morale team—a team that quietly and efficiently accomplishes the job for which it was organized, and finds ways to do the job better, more cheaply, more safely, and with greater satisfaction. And these results have little to do with the supervisor's positional authority.

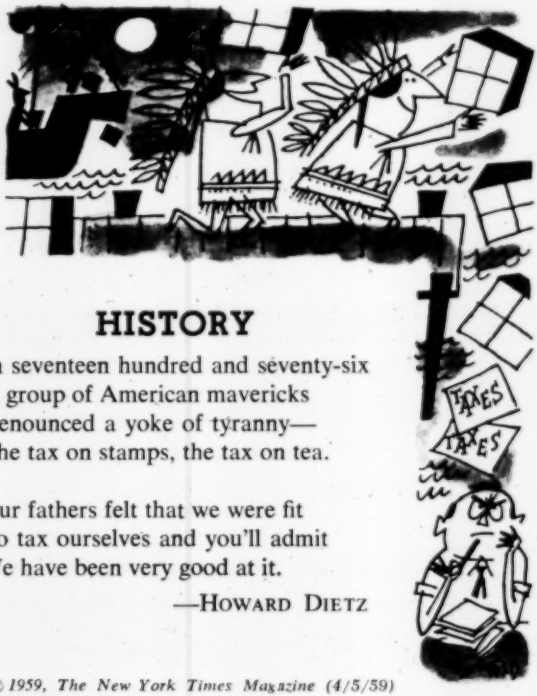
Low costs are achieved when each worker is careful to conserve time, material, tools, and supplies. High efficiency comes about when the worker does his job as quickly and well as he knows how, when he plans his job and is willing to lend a hand to the next man. High morale is achieved when workers

can present their grievances to their supervisor (who will do something about them), when they feel confident that their welfare is being considered, and when they find satisfaction and enjoyment in their work, under a leader they respect.

Cooperation must be earned

These conditions cannot be legislated: They have to be earned by the supervisor himself. A man earns personal authority by having experience and knowledge in the field in which he has to make decisions. He earns it when he is interested enough in his people as individuals to ask about and listen to their problems. He does not feel he has to pull rank to get his ideas accepted. He considers that his job confers on him not only responsibilities to management, but also responsibilities to the people under him.

Cooperation, loyalty, and respect are the tools with which a supervisor achieves success. These tools cannot be given by management. They can be given only by subordinates who feel that they are deserved. ♦



HISTORY

In seventeen hundred and seventy-six
A group of American mavericks
Renounced a yoke of tyranny—
The tax on stamps, the tax on tea.

Our fathers felt that we were fit
To tax ourselves and you'll admit
We have been very good at it.

—HOWARD DIETZ

© 1959, *The New York Times Magazine* (4/5/59)

LET'S GET DOWN TO CASES

Every month, SM presents true stories of tough situations supervisors have faced. The core of each story is an unsolved problem.

How would you handle it? Your answer and the steps you take in arriving at it can be of the utmost value to you.

If you consider the cases by yourself, it might be worth while to jot down your questions, your reasoning, your decisions.

Or, discuss one or more cases with a group of people—fellow supervisors, family, or friends. You'll find that each person has his own way of looking at the problem.

Point of Privilege

FOR SEVERAL YEARS, the men in Jerry Salerno's department have made a practice of lining up at the time clock a few minutes before quitting time. When Jerry was promoted to foreman a few months ago, he didn't try to curb this practice—especially since it was followed by most departments in the plant.

But last Monday, just before quitting time, the vice-president in charge of production took some stockholders through the plant. One stockholder was heard to ask why the men were quitting ahead of time. And this morning, Jerry got the following memo from top management:

> This is to remind you that employees are expected to remain at their workplaces until the end of the working day. They should not line up at the time clock until the quitting signal sounds.

Jerry realized that enforcing this rule meant breaking up a long-standing habit. The men had come to consider this few minutes' break their privilege.

Consider these questions—and ask your own:

1. If you were Jerry, how would you approach this problem:
   _____ Wait until the men line up at the clock, then explain the memo and ask for their cooperation?
   _____ Post the notice on the bulletin board, then stand near the clock before quitting time for the first few days?
   _____ Speak to the men as a group before quitting time, explain the memo, and ask for their cooperation?
   _____ Speak individually with each of the 15 men in the department?
   _____ Or what? What would you substitute for, or add to, any of the above procedures? _____

2. Why did you choose the approach you did? What are its strong points? _____

   Has it any disadvantages; and, if so, how can you overcome them?

   (It may help you, in answering this question, to remember that the same approach doesn't work for every situation nor for every supervisor. You may have individual reasons for choosing a particular approach. If so, what are these reasons?)

A Matter of Money

RALPH ROWE asked his foreman, Andy Johnson, for advice about a serious financial problem. He showed Andy a letter from a collection agency threatening court proceedings unless he settled a $150 grocery bill. The letter gave Ralph only two more days to make a settlement.

"I've tried to borrow the money,

Andy, but I'm already paying on a car loan and a bank loan, and I can't get any more loans without a cosigner," Ralph explained.

As they talked, Andy thought the situation over. This was only the latest in a long series of money troubles. "I guess my wife and I are both poor managers," Ralph has often said. But Andy suspects that the real explanation is that they are trying to live beyond their income.

Consider these questions—and ask your own:

1. What advice or help should Andy give Ralph on this problem? (Check those that you think would apply.)

_____ Help Ralph borrow the money by cosigning a note for him?
Why or why not? _____

_____ Suggest that Ralph apply for a loan from the Credit Union?
Why or why not? _____

_____ Call the collection agency and ask for an extension of time?
Why or why not? _____

_____ Listen sympathetically, but explain that there is little he can do to help?
Why or why not? _____

_____ Suggest that Ralph talk over his problem with someone in personnel?
Why or why not? _____

_____ Take this opportunity to give Ralph some pointers on living within his income?
Why or why not? _____

2. What other action would you consider? Give your reasons.

3. Does your company have any rules or policy covering such a situation? If so, what are they?

Correspondence On Cases

TO THE EDITOR:

We have a case in our offices that surprisingly parallels that of Sue Morton.*

Knowing the ideas and comments of others on this case will help us in deciding how to handle our own problem.

Will you please help us? Let us share in the solutions suggested by your other readers.

(NAME WITHHELD)

TO THE EDITOR:

In the case of Sue Morton and the body-odor problem—I would refer her to the Medical Department. Confidentially, of course.

In Hilda Smith's case *(May SM, page 38)* I would use suggestion number 3, about better preparation for the transfer. I would tell her the transfer might be permanent, if she lived up to her reputation as a good worker.

In the case of Mary Howard *(May SM, page 40)*, I would have arranged then and there for another interview. Supervisors have to be careful about telephone calls that interfere with adequately hearing a worker's story.

—GEORGE B. KINSLER
Peerless Insurance Company
Keene, N. H.

**Sue Morton was the case, in May, 1959, SM, of the girl whose lack of personal cleanliness caused difficulties with her subordinates. Readers are requested to send in their comments and suggestions.*

LET US HAVE FAITH that right makes might, and in that faith let us to the end dare to do our duty as we understand it.

—ABRAHAM LINCOLN

By William Ruchti

Play it safe—and have more fun!

ABOUT 25 YEARS AGO, the Duluth, Minnesota, Chamber of Commerce pinpointed street accidents on a map of their city. One fact was strikingly evident—in some areas, there were very few pins. No one knew why.

One of the members was passing a schoolyard one day, and stopped to watch the children play. He got an idea and hurried back for another look at the map. His idea seemed to prove itself:

When he found organized playgrounds on the map, they showed up in the midst of pin-free areas. Giving children a proper place to play seemed to prevent street accidents!

East Boston, Massachusetts, was one of the many communities to confirm this. When 15 streets were converted to play streets in a sum-

mer-long test, no child was injured within the vicinity. Yet each street was in a congested section.

Just as playgrounds decrease street accidents and save children's lives, similar precautions can provide safety in adult sports and recreation.

A study of 500,000 young people engaged in sports and recreation, conducted by Professor F. S. Lloyd of New York University, indicated that many—64 per cent—of swimming accidents are preventable. Since statistics predict about 7,000 swimming deaths in the United States this year, about 4,500 lives *could* be saved—if care were taken.

Significantly, 50 per cent of the accidents in this study were attributed to "inadequate equipment and leadership controls."

Yet, skeptics say, "Safety rules are obvious. All you have to do is use your head."

However obvious the procedure may seem, though, it must be put into practice to get results. Knowing what to do isn't enough; you have to do it.

People in Nashua, New Hampshire, had long needed better night lighting of their ice-skating rink. The first year improved floodlights were installed—and were kept on until 10 P.M. every night—was also the first year in the town's history that no skaters were drowned.

Avoid surprises

What specific steps can be taken to promote safety in sports? The first is to avoid surprise—a strong element in many injuries and mishaps. Many so-called surprises can easily be foreseen.

For example, you can avoid the dangers of darkness by planning your sport or excursion so that you're back in familiar territory by dusk—or take along a flashlight, compass, or map. (Besides lighting your way, a flashlight may serve as a signal for help in an emergency.)

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Baseball, as one of America's favorite games, warrants special notice. Remember that accidents can happen before and after the game, as well as during it. Therefore, be cautious. Make sure you play on a good field, checking it for holes. Don't cross the field while practice is going on; keep others off, too. Don't stick your fingers through wiring of backstops. Collect (but don't throw) soda bottles that may be lying around. Don't crowd baselines—or batters. And if you're in the once-a-year fathers-and-sons game, it may not be smart to try to make like Willie Mays catching a hard-hit ball. Avoid overexposure—to sun or to anger. And limit the game's length.

Or, you can take precautions against becoming sun blinded or snow blinded or suffering heat stroke or prostration. Avoid overexposure and, when necessary, wear sun glasses to protect your sight. Combat fatigue, as well as dizziness and heat cramps, by taking salt tablets, which help restore the salt you lose through perspiration.

As jet pilots can testify, high altitudes limit the responses of the central nervous system. Avoid this surprise, too. Individual reactions to altitude vary widely enough so that there's no exact level to watch—one person may react adversely at 3,000 feet above sea level, while another person's threshold may be 8,000 feet. But even if you're *not* going to attempt a four-minute mile in the Himalayas, take time to rest when you're climbing the side of the Grand Canyon, the steps in the Statue of Liberty, or stairs and steep slopes anywhere.

Falls are a chief cause of sports injury. Avoid them, too. The New York University survey mentioned earlier pointed an accusing finger at uneven ground, slippery surfaces, and collision with extraneous objects. Mark off your game areas, apart from other groups. Clear the field of clutter. Keep others off the area—especially small children and dogs. In hiking or climbing, watch for loose rocks and crumbling trails; if you must look over a precipice, do it lying down. Remember, too, that it's easier to climb up than down; so whether it's a garage roof, a tree, or a mountain, don't overreach yourself.

You may be driving on country roads to and from sports areas, recreation grounds, or your own vacation spot. Here it's particularly important to be on the alert for pedestrians who may appear from unexpected places. If you must walk on a highway yourself, walk on the left, facing oncoming traffic. If you're walking with other people,

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Body-contact sports, such as football, boxing, or wrestling, invite injury by their very nature. Care must be a constant factor, even in touch football (whose title belies its high accident rate). In fact, many injuries occur in these sports because older players (especially those who once *were* expert) tend to overestimate their current capabilities and condition.

Match opponents in weight and experience as evenly as possible—especially in the ring. Insist that the indicated protective equipment—headguards or mouthpieces for boxers—be worn. Perhaps most important, appoint a referee to make sure that game rules and time limits are observed.

stay with your group. Cross streets at pedestrian crossings or corners. And, whether you're a pedestrian or a driver, observe traffic signs.

On the over-all matter of avoiding unpleasant surprises the National Recreation Association has offered this capsule advice: If in doubt, don't—eat, touch, or climb. Following this rule will protect you from contaminated water or poisonous fungi, from poison ivy or poison oak, from dangerous falls, and from all kinds of animal bites.

Proper equipment

Another way to assure safety and have more fun is to use proper equipment. Practically all sports require some special outfitting.

Athletes, almost constantly on their feet, should make sure they have adequate footgear, for example. Tennis or deck shoes needn't be restricted to a tennis court or boat—they can also prevent slipping during a fast game of ping pong. Shoes equipped with cleats pivot better if there is only one cleat, rather than two, under the toe. If your leg turns but your shoe doesn't, you could pull a ligament. Fishermen need waterproof, rock-gripping, boots or waders. Hikers need boots substantial enough for heavy duty, but light enough to flex easily and to admit air. Socks, too, should be in good condition—warm, absorbent, and without blister-causing holes or lumpy darns.

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Camping and hiking: In camping, fire is the chief danger. Prevent it by using fire-resistant materials for tent or cabin, and flashlights instead of lanterns. Minimize hazards by taking extra care around dry underbrush, by protecting or isolating campfires and stoves, by observing strict smoking rules, and by correctly installing whatever electrical wiring may be necessary. In a large camp, prepare to fight fire by holding drills and providing extinguishers, axes, and pumps.

Otherwise, choose your campsite carefully, identify hazards, and warn others about them. Wear protective clothing, use insect repellent, and boil water before you drink it. (You can restore its flavor by aerating it.)

Hikers, too, should take precautions with matches—to keep them dry for possible emergency use, and to extinguish every used match completely. Hikers and climbers should also take special care of their feet, wear clothing to suit the weather, rest often, and make sure that they have—and know how to use—whatever equipment they may need: hand axes, ropes, compasses, and maps.

Doctors say, "Once a sprain, always a sprain"—in other words, you can expect to repeat a sprain unless you take extra care. Therefore, strap or tape the weak ankle, use a wrist guard (until your sprained wrist really feels fine again), wear the proper supports. In most sports, your body goes through some pretty hectic movement.

Other common-sense ideas about sports equipment: Avoid pins, which may come unclasped, exposing a point that could be dangerous. Parents tell children not to run with all-day suckers in their mouths—but are adults careful not to run with pencils, combs, or other blunt instruments in their pockets? These apparently harmless items can become lethal, if you fall on them.

Sportsmen should also take particular care in carrying and using knives, hatchets, fishhooks, and other sharp-edged equipment.

And any athlete who must wear glasses during the game should get shatterproof lenses or, for sports like baseball, a protective face mask.

It's also evident, of course, that the equipment required for a specific sport can cause damage unless it's treated with respect—for example, baseball bats, guns, trapezes, spiked shoes, golf clubs. Too obvious? Well, one city removed all slides from its playgrounds when it was realized how many accidents they caused.

All right, you've set your mind on a conservative approach and you've

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Circle games: Even simple sports like dodge ball require some caution. There is the danger of someone's being hit in the face, of falls, or of collisions. Therefore, play in a marked-off area, if possible. Match teams as evenly as possible and appoint a leader to supervise.

Golf: Overexertion and overexposure are again the chief threats in this sport, which otherwise is less hazardous than most. A safe procedure: Limit your game *before* you start and don't get carried away. It's easier to stop, as announced, after nine holes than to quit later on in the middle of a round.

Gymnastics: Many people avoid formal exercise, yet find themselves doing beach stunts like teaching their children to stand on their heads. At least in a gym, they would have a mat and probably an instructor; unsupervised gymnastics can result in painful injuries or broken bones. The best rule: Try only the tricks that you *know* you can do. Even with tricks that are a cinch, work with a mat or a reasonable substitute, stay close to the ground, and *don't take risks.*

checked your clothing and equipment. How about checking yourself?

Your physical condition

Physicians and coaches agree that the older the athlete, the more difficulty he has staying in shape. One sports manual puts it this way: "It's a definite fact that athletes over 30 are not as supple or resilient as their younger comrades."

So if you're older, play it smart and take it easy. If you wouldn't drive your car at top speed—and few of us would—why drive yourself that hard?

An annual medical examination will tell you whether you're capable of engaging in any hard and competitive sport.

Being in good physical shape doesn't mean, however, that you're in top form and capable of prolonged periods of great exertion. Get "in condition," as coaches say, by working into it gradually. Thus, even if you don't intend to follow the Olympic rule book, try to maintain some form of athletic training—if only by getting all the sleep you need, plus some exercise *every* day.

Diet, of course, is an important part of training. And many professionals claim that "shaking" and "pushing" are the two best exercises—"Shake your head 'no' at second helpings, and push yourself away from the table after the first."

A college football player may need 4,500 calories a day; but the

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Hunting and shooting: Treat *every* gun with the respect due a loaded gun. Carry the gun so you can control the direction of the muzzle, even if you fall. Make sure that the barrel and action are clear of obstructions and that your ammunition is the proper size. Keep weapons and ammunition out of the reach of children, preferably under lock. Avoid *all* horseplay.

Keep the safety on until you're ready to fire; then be absolutely certain of your target before you shoot. Don't fire at hard flat surfaces, for bullets can ricochet. Never, never mix shooting with drinking.

If you shoot with a bow, select one that fits you, shoot within your range (to avoid deflected arrows), and don't use splintered or faulty shafts. It's also advised to wear wrist and/or finger guards.

Whatever your weapon, however, take instruction first, *then* go hunting or shooting. Incompetence, inexperience, and lack of control make fatalities soar.

Riding: Choose a mount you can ride; walk around the head of the horse, and mount from the left with reins held taut in your left

average office worker needs only 2,500. High temperatures, great humidity, and prolonged exercise may increase your nutritional requirements. But if you're like most people, chances are that overeating is your problem.

Also, don't eat heavily and then play hard. While your body is concentrating on digestion, it can't satisfy the extra demands of physical exercise. It's best to delay heavy sports until three hours after you've eaten.

Even if you're in good physical shape and feel in pretty good condition, don't overdo the first time out —by playing 36 holes of golf, or several sets of tennis as soon as you've dusted off your racket. Take it easy. Know what you can do—and what you can't!

And just as you should start the season moderately, you should start each day moderately. Warm up before heavy exercise: Do a few simple exercises (leg raises, situps, pushups), run around until you feel the blood flowing faster, limber up stiff muscles by stretching them gradually, easily. If you take time out from play, warm up before you start again. Trackmen, for example, warm up repeatedly during a meet, even though they're in peak physical condition.

In an emergency

If a sports accident does occur and you're faced with an emergency,

hand. Keep 12 feet behind—and to the side—of the horse ahead of you. Dismount to cross highways.

Good manners distinguish the good horseman. Therefore, observe the courtesies and rules established for safety.

Court games—handball, badminton, tennis, basketball, or volleyball: In each, the major threat is slipping and falling, which you can usually prevent by wearing tennis shoes or sneakers, and by keeping the playing area clear of obstacles. Because these games require looking up (and not watching where you're going), play on smooth lawns or courts rather than irregular fields or pavements.

No sliding of any sort should be permitted on the court. And in faster games like basketball, where falls seem inevitable, players should wear knee guards.

Also, don't overexert yourself, especially in the hot sun. That is a great danger in tennis, where people who play only during vacations may quickly overdo.

Otherwise, observe the rules of each game; many of them are intended for the players' safety.

don't panic. Fear is universal—and often reasonable. But panic is fear out of control. It can spread contagiously through groups, causing paralysis or stampede.

If you feel that panic is developing, distract the group's—or your own—mind from the panic-causing element. *Determine* to remain clear headed and to maintain control.

Distracting the group is best done by intelligent, forceful leadership—a role that a supervisor is well prepared to fill. Take command and try to restore calm. In a sports arena, for example, "The Star Spangled Banner" could be played, to get people to stand up—and to stand still. Provoking conditioned reactions is an easy way to calm people.

The best way to control panic, however, is to avoid it. And the way to do so, whether in a crowd or alone, is to know how to handle the situation.

• *Use first aid.* Every athlete should have access to a first-aid kit—in the locker room, the glove compartment of his car, his camping equipment, or baggage. (See "Con-

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Water sports: Here again, know what you're doing, whether it's swimming, skin diving, or boating:

Don't swim alone, nor any distance on a full stomach, nor far from shore unless you're accompanied by a boat or a *competent* swimmer. Don't swim when you're tired, and don't stay too long in cold water. Avoid contaminated water, stagnant ponds, or water marked "dangerous." Don't dive into water that you haven't explored carefully.

If you get a cramp in your leg, quickly straighten out the knee of the cramped leg, then press that foot hard upon the instep of the other—i.e., use the foot of your good leg as a "floor" on which to stomp out your cramp. And keep cool; ineffective movements and overbreathing can aggravate cramps.

Be sure to check on currents and tides *before* you swim into them. Even a strong and expert swimmer can get caught in strong currents.

Don't try to rescue a drowning person unless you know how. Unprepared, you, too, may be pulled under. And your try may deter others who could otherwise save the person in distress.

Skin divers, whether using equipment or not, should dive conservatively and not overestimate safe depths nor stay under water too long. Divers who get caught in weeds shouldn't move vigorously; slow, careful movements will prevent further entanglements. All

tents of First-Aid Kit," SUPERVISORY MANAGEMENT, June, 1958, p. 46.)

• *Signal for assistance.* You may use a flashlight to summon aid. If you're lost in the wilds or unable to return, there's an international distress signal you can use, but use it carefully: three fires built 50 feet apart and in a row. Make them smoky with green or damp leaves. A white handkerchief or shirt may also be used as an emergency signal, tied to a tree, waved from a boat, or left on a trail. Remember, too, that Morse code for distress is SOS: three dots, three dashes, and three dots (...———...).

• *Call a doctor.* Physicians and often ambulances are generally on call at organized athletic events. Otherwise, call your own doctor or a hospital in the nearest town.

Most important of all, however, is to *prevent* accidents that could bring on the emergency. Use common sense in your athletic activity. And don't play the most dangerous game of all—sticking your neck out.♦

skin divers should also have a resting place or float to return to, if only an inner tube held by a small anchor.

People who drown usually have not been swimming, however (they're often dressed), and a high percentage of them *cannot* swim. Therefore, always be cautious around water.

Know how to handle boats before you take one out. In small boats, step in the center always and, if possible, hold on to both sides. Never overload the boat, nor permit any byplay that may threaten safety. Carry a life preserver for each passenger.

If you're in a boating accident and end up in the water, remove your clothing. Trousers (or a dress) can be knotted and inverted to trap air, then used as a float. Whatever happens, try to remain calm.

If you're ever trapped in a submerged, closed vehicle, like an automobile, you'll have difficulty opening a door (to escape and swim to the surface) until the water pressure is equal inside and outside the door. Therefore, stay where you are and wait for the water to enter. (Even though the car is totally under water, you won't drown, for almost inevitably, a layer of air six to eight inches thick will be trapped under the up-side of the vehicle.) When you think that the water pressure *is* equal, let everyone in the car take a deep breath first, *then* try to open the door, slip out, and "climb" to the surface. ♦

Digests of the month

Getting Your Boss's Ear

GETTING YOUR BOSS'S EAR when you need it isn't always easy. Like you, he's caught in a tight time squeeze. But by following some simple guides, you can make it easier to communicate with him—and do it more effectively, too.

1. Don't impose on him.

Unintentionally, a manager may impose on the self-control or good nature of his superior. For example:

Bending his ear. Excessive demands on your boss's time make his job more difficult. Don't, for instance, burden him with minor details unless he shows particular interest in knowing them. He may be interested, but often he has no time for nonessential conversation.

Crying on his shoulder. Although the boss should certainly be concerned with your problems, that doesn't mean you should use him as a convenient wailing wall. It's only natural to want sympathy when tough breaks get you down. But the man who habitually pours out his hard-luck stories to his boss may not be showing a constructive attitude toward his responsibilities.

Putting the pressure on him. "Boss, you've only got one more week to decide how we're going to handle the Acme order." Sometimes you have to press your boss for a necessary decision. But you don't have to dump the situation on him like this. Try to simplify his decision-making problem. Can you suggest alternatives from which he can choose? Can you suggest a course of action backed up by sound logic? Or can you supply additional information that will help clarify the picture for him?

Stepping on his toes. "If I were you, boss, I'd rip down that shed and put up a two-story building in its place." Whether the idea is a good one is not the point. The suggestion is being conveyed in a way that may antagonize your superior.

There's a classic case of a manager who told his boss, "If you were smart, do you know what you'd do?" The boss felt he *was* smart, and he fired his subordinate.

2. Give your boss a chance to know you.

The owner of a food-processing company said recently, "The average manager nearly always fails to put himself across with his boss. He just

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assumes that as long as he keeps out of trouble, his boss will spot his sterling qualities. But he doesn't let the boss get close enough to him to tell him apart from the man who delivers the clean towels."

It's important for your boss to know you as a person. And that doesn't mean just letting him know your virtues and your successful performances. There are a number of reasons he should know your weaknesses, too:

He will be in a better position to help you.

If you improve with his aid, he will take personal pride in your improvement.

A good boss wants to know the whole man, both strengths and weaknesses.

3. Keep your boss's needs in mind.

Once you've got the boss's ear, how can you make the time he spends with you worth while? Here are some tips:

Keep him fully informed. Sometimes you can help your boss by thinking in broader terms than your immediate responsibility for keeping him informed. Naturally, you're going to let him know how your department is responding to a new company policy or what the inventory is on key materials. But try to include developments, imminent or potential, that can help him in his long-range thinking and planning. For example, you might say, "It may be years off, but some day someone's going to develop a continuous process to replace our present batching system. Do you think it might pay to go over our equipment needs with that in mind?"

Lighten his load. Present your message clearly and concisely, giving him the heart of the story first and the details later. Foresee all eventualities, if possible, so that one conference will cover a situation well enough to make further meetings unnecessary. If other managers are involved in the problem, cooperate with them so that you can all meet with the boss at the same time; this saves him from having to go over the same ground with them.

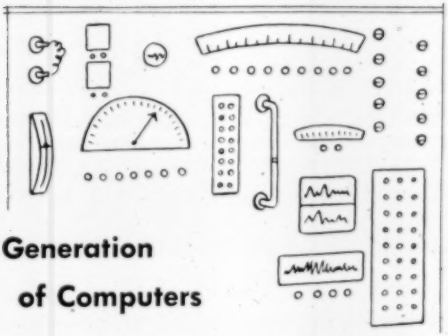
Try to be positive. As you know, a boss can get pretty discouraged if he hears nothing but complaints and problems. A manager in an electrical-instruments plant recently said, "When the breaks are tough, I make it a point to dig out some facts on the brighter side. For a man like my boss, who takes his failures pretty hard, a little encouragement acts like a blood transfusion."

Remember that part of your job is to help your boss do his job. If you keep that in mind when you want to talk to him, you can always get his ear.

• *Auren Uris*
FACTORY
April, 1959

ONE WHO FEARS FAILURE limits his activities. Failure is only the opportunity to begin again more intelligently.

—HENRY FORD



The Next Generation of Computers

THE NEW COMPUTERS will be 20 to 100 times faster than today's million-dollar machines. Their layouts are so elaborate that a computer is needed to design them. Their timing will be so exquisite that electronic pulses surging through wires at nearly the speed of light may occasionally be too sluggish for them. And they will be expensive. The first of the new machines, due to be completed this year and next, will cost about $3 million apiece, almost twice as much as the biggest computers now in existence. The major difference between the new generation of computers and their predecessors is the principle of parallel operation. The parallel computers, as the designers call them, are really two or three big computers harnessed together and working as a battery.

Happily, the designers are making it possible for the new machines to program their own operations in large measure, for a human operator would be overwhelmed by the job of keeping track of the interplay of the various units in order to schedule the work step by step. With several operations going on simultaneously, the program will have to determine not only what the computer is to do, but precisely when it must do it. The machines will direct their own traffic of information. All the human programer can be expected to do is indicate roughly the logical sequence of operations.

With automatic programing, moreover, the computers can act on relatively simple instructions. A man with a problem to solve will be able to order the computer to get at it in a language much like ordinary English, and he will get back his answer without having to know what went on inside the machine.

The parallel computers will eventually translate languages, notably Russian, faster and cheaper than a human can. For nuclear physicists, they will determine with precision the behavior of particles. They will help the military and businessmen reach more logical decisions.

But even before the first of the new computers has been completed, research scientists are looking far ahead, to other generations of machines that will imitate human thought processes—computers that will employ judgment and a kind of intuition to solve problems. Some day, conceivably, probably more than a century from now, scien-

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tists will build a machine much faster and more compact than the human brain—and almost as versatile.

Heretofore, computers have been able to handle only one operation at a time. Some parts of the machines have inevitably been idle at any given time. Arithmetic units, for example, have had to pause for as long as several seconds while input units searched for data in reels of magnetic tape. It has never been practical to store all the data in magnetic cores and other fast-acting memory components, from which information can be retrieved in about a millionth of a second, because the components are too expensive: they cost about $1 per "bit" of information.

In the new computers, waiting time will be cut to a minimum. The scheme of the National Bureau of Standards' Pilot is typical. A primary computer will do most of the arithmetical calculations. A smaller secondary computer will act as traffic cop, keeping track of various parts of the program, and occasionally helping calculate parts of the problem. Meanwhile, a third computer will control incoming and outgoing data. It will anticipate what information the primary computer will need, search for it through several reels of magnetic tape simultaneously, convert the data to usable form, and pass it on to the primary computer at just the right instant. Internal traffic jams will be solved in a fraction of a second.

There is already a long list of problems waiting for the new computers. They will be able to solve most of these with standard mathematical methods, although mathematicians will, in the next few years, very likely develop new methods to exploit the speed of the new machines.

Some kinds of problems that mathematicians have been solving by techniques developed especially for computers have outgrown the speed and capacity of present-day machines. A typical example is linear programing, which some companies use to plan product distribution, manufacturing schedules, and other complex business operations. A linear program consists of a great many statements concerning the interrelationships of various factors that have to be considered in reaching a decision. A sample statement: "Selling price is greater than manufacturing cost plus sales commission."

These statements are all expressed symbolically as a rectangular array of numbers called a "matrix." By manipulating the matrix, a mathematician can arrive at optional plans—e.g., a plan that maximizes profit, or one that minimizes time. In their exploration of linear programing, mathematicians have encountered many real-life situations—such as the operation of an oil refinery—that require matrices as big as 200 rows by 1,000 columns. Manipulating such an enormous matrix requires 2x200x200x1,000, or 80 million, separate multiplications—a job worthy of the new computers.

The new computers would have been impossible without the invention of automatic programing, which has immeasurably increased the usefulness of present-day machines.

It has been said that a computer must be instructed as painstakingly as if one were addressing an idiot child. Only the simplest "knowledge" is built into a computer. When a programer

wants to make a machine multiply two numbers, for example, he must furnish the plan. He must write out in code the memory locations of each number, an instruction to multiply, and a memory location in which the result is to be stored.

Programers for the parallel computers will probably never have to write machine code. Instead, they will use "compilers." Compilers are magnetic tapes on which are coded most of the common mathematical routines plus a master tape that instructs the computer how to put together various combinations of the routines.

To the operator of a computer, a compiler provides a special language for writing out orders to the machine. Almost anyone can read the language after a little practice, for it is based on ordinary English and mathematical notation. The time will come when clerical workers with a little special training will probably do most of the programing for day-to-day problems.

• George A. W. Boehm
FORTUNE
March, 1959

How Do You Know When a Job Is Done?

PEOPLE DIFFER enormously in their judgment of when a piece of work is actually finished. This fact, turned up by the research of management experts and industrial psychologists, may be a basic reason that people who appear to be hard working and conscientious still produce poor results.

Many workers just don't know the right time to throw the switch that shifts their effort from an old job to a new one. This is what one psychologist calls a "sense of closure"—the feeling of completeness and satisfaction that comes from having rounded off a given task. It's the solid conviction that, "I'm through with this job and I can go on to something else."

Psychologists believe that only a minority of workers at any level have the ability to work on a job just to the point of maximum effectiveness. Some compulsive people hang on too long, fretting over petty details that aren't worth the bother. But the majority tend to let go of a task far short of its completion point. This premature closure is apparently responsible for many traditional business problems, such as buck passing and procrastination.

Here is an example of how a faulty sense of closure can result in poor job performance. A typist is told "Be sure to get this letter out tonight." Depending on her sense of closure, she will take this to mean one of three things: *1)* Type the letter and put it on the boss's desk; *2)* type it, get it signed, and put it in the Out basket; or *3)* be sure the typed and signed letter goes to the mail room in time for mailing that night.

Many typists who would stop at the second point would express astonishment if they were criticized. Because they had a feeling of closure on completing the routine part of the job, they can't see that more might be expected of them.

In many jobs, particularly on higher levels, it is not easy to know whether

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a piece of work is really finished. But the knowledge that your judgment of closure needs to be rechecked frequently will help to improve performance. Besides improving your own sense of closure, there are ways you can help your subordinates improve theirs.

1. *Make every responsibility completely clear.* You can't predict exactly what any job will entail, but you can provide certain guides to what constitutes complete performance.

2. *Analyze excuses.* There are, of course, valid excuses for some delays and failures, but upon analysis many excuses will be revealed as cover-ups for the worker's faulty sense of closure.

3. *Rate the closure sense of your workers.* Here are some questions that will give you an idea of how good your subordinates' sense of closure is:

Do people in your department frequently raise questions or point out problems without offering a solution?

Do some workers complain that they have to complete work that should have been done by others?

Are there people in your department who, when presented with a tough problem, are content to find a solution that just barely "gets them out from under?"

When a temporary solution to a problem is found, do your subordinates drop the subject without looking for a permanent answer?

Do you still have problems pending that seemed to be near solution at this time last year?

Does it frequently happen that when something goes unfinished or an error is made, no one is quite sure who was responsible?

Is a large proportion of the memos and meetings in your department devoted to explaining why certain results weren't achieved?

If three or more of these questions have to be answered "yes," you may have a closure problem in your department. Knowing this, you can combat the problem by training everyone on your staff to stick with a job until it is either completed or ready to turn over to someone else.

• *Charles A. Cerami*
NATION'S BUSINESS
Vol. 47, no. 1

The Sun Also Fries

WHAT DO YOU REALLY know about sunburn? Everybody likes to relax in the sun, but overexposure can turn a pleasant experience into a painful one, and can even cause permanent damage to your skin. Now that the beach season is here, it's a wise idea to know what the sun can do to you and what you should do to keep from being badly burned.

• *What are the health benefits of exposing bare skin to summer sun?*

The only proved physiological benefit of sunlight on normal skin is the formation of vitamin D. Ordinary daylight and diet insure adequate vitamin D for almost all normal adults, so the contribution of sunbathing is seldom needed.

• *Except for severe sunburn, does intense sunlight have any injurious effects on the skin?*

Continued overexposure to baking sunlight may produce permanent changes in the skin after a number of years. Anyone who consistently acquires a deep tan during the two or three hot summer months may, after a few years, have a skin as truly *aged* as that of a much older person. Skin cancer is somewhat more frequent in people who have had continued exposure to sun and weather for many years.

• *Can a single bad sunburn damage one's complexion?*

Yes, if living skin cells and pigment-making structures within the skin are sufficiently injured. Irregular skin areas may look bleached from failure to produce pigment, and the skin has a mottled, blotched appearance.

• *Doesn't skin vary a great deal in the amount of sun it can stand?*

Yes, skin varies considerably in thickness, oiliness, natural pigmentation, and structural changes brought about by long exposure. There is no arbitrary dose of sunlight that will be safe for everybody under all conditions. Redheads, blondes, brownettes, blue-eyed, fair-skinned people, and those whose skin freckles instead of tanning evenly need to be especially wary of direct hot sunlight, at least until they have built up some defenses by cautious, graduated exposure. Dark-skinned, dark-haired, dark-eyed people, and others who tan easily enjoy more immunity to sunburn—but not complete immunity. No human skin can resist unlimited exposure to burning rays of the sun.

• *Can you get a suntan without first suffering at least a very mild sunburn?*

For what might be called a "true" suntan, some burning of the skin is necessary, but not a burn that would cause discomfort, blistering, or severe peeling.

• *Is there such a thing as a "false"*

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tan which gives little sunburn protection?

There is a tan that looks like any tan but does little to prevent a blistering sunburn. It is caused by rays of the sun that tan without burning; they penetrate into deeper layers of the skin where pigment is produced. This process does not give maximum protection against the sun. But it can give its owner an unwarranted feeling of security, which in turn can lead to a bad sunburn.

• *Is it possible to acquire an immediately visible tan in a single day?*

Only the "false" kind. This tan may occur unexpectedly, at times of day when you can't get sunburned, as in early morning or late afternoon when sunlight has little burning capacity but is quite rich in nonburning pigment-darkening rays.

• *How can you spend many hours at a beach or outdoors without suffering severe sunburn?*

Time of day is important. You can stretch your time in the sun by avoiding the part of the day when burning ultraviolet is most intense, from 11 A.M. to 2 P.M. No sunburn is likely from exposures before 8 A.M. and after 4 P.M. At intermediate hours, except around midday, the intensity of burning is lessened.

• *Must you be exposed to direct rays of the sun to get a tan or a sunburn?*

Not at all. Some of the most fiery sunburns have resulted from lengthy basking on a hazy, lightly overcast, or foggy day. Burning rays can bounce and be reflected from water, sand, and minute droplets in the air. They can even burn into the presumably safe shade of a beach umbrella. Water reflects twice as much radiation as a green field. Scattered skylight is a much more powerful burning glass than most sunbathers realize. Actually, "skyshine" is *more* burning in summer than direct rays of the sun except those at midday.

• *Is there any way of judging how long an untanned person can stay in the sun without getting a painful burn?*

Perhaps the simplest rule is to use a watch to note how many minutes it takes the skin to turn the faintest pink you can perceive. Two to three times that number of minutes is all the sun you can take with comfort. Five times the minimum exposure will result in a painful burn; ten times, a blistering burn. Moderate to severe sunburn keeps getting redder and redder for as long as 20 hours after you move out of the sun, so you can't wholly rely on shade of redness to tell you how badly you're burning.

• *What is the safest and simplest method of acquiring an attractive and protective suntan?*

On the first day, expose yourself to the sun for 15 to 20 minutes (or less if you have very fair skin). This means actual exposure; thus, if you lie on your stomach for 15 minutes, you're entitled to equal time lying on your back. (But don't forget you are also exposed to the sun while walking to your chosen spot.) On the second day, increase exposure by one third; for instance, from 20 minutes to a little less than half an hour. On the third day, again increase exposure by a third, say from 30 minutes to 40. And so on.

By the fourth day, new pigment

should begin to darken your skin. In a week you should have enough skin thickening and pigmentation to give considerable protection against burning sunshine, without having paid the penalty of a severe sunburn or of skin that peels off in ragged flakes.

• *Do suntan preparations help you to get a tan more quickly?*

Only in the sense that they enable you to stay in the sun longer with less risk of burning. Suntan lotions and creams do not in any way increase the speed of one's natural tanning mechanism. They contain chemicals called sunscreens, which absorb various wave lengths of burning ultraviolet rays to various degrees.

Even when you use a suntan preparation you can get a bad burn by staying in the sun too long. Also, the preparation may be removed by swimming, may be spread in too thin a layer, or may have missed important skin areas. Protection is usually more thorough if one coating is applied, allowed to dry, then followed with a second coat.

• ***Donald G. Cooley***
TODAY'S HEALTH
June, 1959

An index to SUPERVISORY MANAGEMENT is published annually in the December issue. The contents are indexed monthly in the *Business Periodicals Index* published by The H. W. Wilson Company. SUPERVISORY MANAGEMENT is microfilmed by University Microfilms, Ann Arbor, Michigan.

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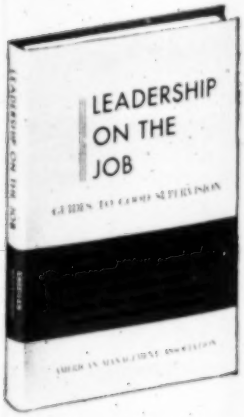

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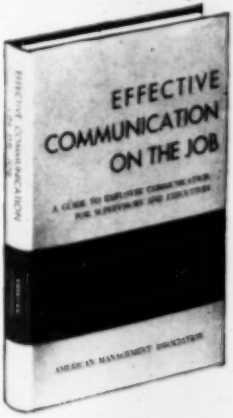

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